THE LIBRARY OF CONGRESS
1800

Class AE5
Book U47
Copyright No.

COPYRIGHT DEPOSIT.

PYTHON

THE UNITED EDITORS PERPETUAL ENCYCLOPEDIA

A LIBRARY OF UNIVERSAL KNOWLEDGE
COMBINED WITH AN
UNABRIDGED DICTIONARY
OF THE
ENGLISH LANGUAGE

MANAGING EDITOR
GEORGE EDWIN RINES
ASSISTED BY MORE THAN FIVE HUNDRED OF THE MOST
EMINENT SCHOLARS AND SPECIALISTS

THIRTY VOLUMES
ILLUSTRATED

UNITED EDITORS ASSOCIATION
NEW YORK—CHICAGO
MDCCCCXI

AE5
U47

Copyright, 1909
by
The United Editors Association

Copyright, 1911
by
The United Editors Association

© Cl. A297620

SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables; (′), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	*māt, fāt, fāl, ā.*
ă	mat, fat	*măt, făt.*
â	far, calm, father	*fâr, kâm, fâ′thėr.*
ä	care, fair	*cär, fär.*
aw	fall, laud, law	*fawl, lawd, law.*
ē	mete, meat, feet, free	*mēt, mēt, fēt, frē.*
ĕ	met, bed	*mĕt, bĕd.*
ė	her, stir, heard, cur	*hėr. stėr, hėrd, kėr.*
ī	pine, ply, height	*pīn, plī, hīt.*
ĭ	pin, nymph, ability	*pĭn, nĭmf, ă-bĭl′ĭ-tĭ.*
ō	note, toll, soul	*nōt, tōl, sōl.*
ŏ	not, plot	*nŏt, plŏt.*
ô	move, smooth	*môv, smôth.*
ō	Goethe (similar to *e* in her)	*gō′tėh.*
ow	noun, bough, cow	*nown, bow, kow.*
oy	boy, boil	*boy, boyl.*
ū	pure, dew, few	*pūr, dū, fū.*
ŭ	bud, come, tough	*bŭd, kŭm, tŭf.*
û	full, push, good	*fûl, pûsh, gûd.*
ü	French plume, Scotch guid	*plüm, güd.*
ch	chair, match	*chär, măch.*
ċh	German buch, Heidelberg, Scotch loch (guttural)	*bôċh, hī′dėl-bĕrċh, lŏċh.*
g	game, go, gun	*gām, gō, gŭn.*
j	judge, gem, gin	*jŭj, jĕm, jĭn.*
k	king, cat, cot, cut	*kĭng, kăt, kŏt, kŭt.*
s	sit, scene, cell, city, cypress	*sĭt, sēn, sĕl, sĭt′ĭ, sī′prĕs.*
sh	shun, ambition	*shŭn, ăm-bĭsh′ŭn.*
th	thing, breath	*thĭng, brĕth.*
th̄	though, breathe	*th̄ō, brēth̄.*
z	zeal, maze, muse	*zēl, māz, mūz.*
zh	azure, vision	*ăzh′ėr, vĭzh′ŭn.*

ST. SOPHIA, *sānt sō-fē'â*, CHURCH AND MOSQUE OF, celebrated structure at Constantinople, long an object of great interest. It was built originally by Emperor Constantine 325–326, at the translation of his seat of empire to Byzantium; and is named as being dedicated, not as commonly supposed, to a saint of that name, but to the *Hagia Sophia* (Holy Wisdom), that is, to the Eternal Wisdom of God, or the Logos, the second of the hypostatic distinctions in the Trinity. The building of Constantine was rebuilt and enlarged by his son Constantius; and this second church of Constantius having been destroyed 404, was rebuilt by Theodosius the Younger 415; and it lasted unaltered till the celebrated Nika Sedition, or Battle of the Factions of the Circus, under Justinian 532, in which it was totally destroyed. The present building is substantially that erected by Justinian 532, in expiation of this sacrilege. Its erection occupied less than seven years, and the history of the work and of the details of its material and construction is full of marvels. Ten thousand workmen are said to have been employed. Materials were supplied from every part of the empire, and comprised remains of almost every famous temple of the ancient paganism. The sedilia of the priests and those of the patriarch were of silver gilt. The dome of the tabernacle was of pure gold, and was surmounted by a gold cross weighing 75 lbs., and encrusted with precious stones. All the sacred vessels and other apparatus were of gold. The altar-cloths were embroidered with gold and pearls; and the altar itself was composed of a mass of molten gold, into which were thrown pearls, sapphires, diamonds, onyxes, and every other object which could raise its costliness to the highest imaginable degree. The total cost of the structure is stated by the ancient authorities at 320,000 *pounds*. Some regard this as pounds-weight of silver, others as of gold. One of the latest writers on the subject, Neale (*Eastern Church*, I. 237), adopts the latter estimate, and thus computes the cost about $65,000,000.

The building has an area of 70,000 sq. ft. It may be described as a square of about 240 ft., forming interiorly a Geeek cross. Around the interior extends a woman's choir or gallery, supported by magnificent pillars mostly borrowed from ancient buildings. In the centre rises a dome (diameter 107 ft., height 46 ft.) supported by two great semi-domes, which in their turn rest upon smaller semi-domes, the whole presenting a series of unexampled beauty, and with the advantage of providing a central open area 200 ft. by 100 ft. The height of the dome is 175 ft. The building is approached by a double porch about 100 ft. in depth. The whole of the interior was richly decorated with sculptured marble and mosaics. Even in the reign of Justinian, further reconstruction of the building became necessary, the dome having fallen in, shaken by earthquake; but this was the last important change in the structure within the Christian period of Constantinople.

On the occupation of the city by the Turks 1453, St. S. was appropriated as a mosque. All its purely Christian

fittings and internal structures were swept away. The Christian emblems were either mutilated or covered from view by a coating of plaster. The latter course was adopted throughout the building in the case of mosaic pictures containing representations of the human figure, which the Koran proscribes as unlawful; thus the original mosaics of the Justinian age have in great part escaped destruction. About the middle of the 19th c. Sultan Abdul Medjid having ordered a complete restoration of the building, these mosaics were accidentally brought to light, and, with the consent of the sultan, artists were sent from Berlin, who, with the assistance of the architect employed by the Turkish government, made accurate copies of all these interesting relics of antiquity, which have been published at the expense of the Prussian government by Salzenburg, the artist thus employed by the king. The interior of the building at present is very judiciously restored for Mohammedan worship, the Christian decorations being again carefully covered up, coated with plaster in imitation of mosaic-work. Like all mosques, St. Sophia is closed against Christian visitors except by special firman, which, however, is easily obtained. The weight of the dome has more than once threatened to crush in the substructure, rendering repairs necessary.—See Von Hammer's *Constantinopolis* (1822); Salzenburg's *Alt-christliche Baudenkmale Konstantinopels* (1854); Haghes, *Aya Sofia Constantinople* (London 1854); De Amicis, *Constantinople* (transl. from 7th Italian edition); W. Besant, *Constantinople* (1879).

SAINT SULPICE: a famous seminary in Montreal, Canada, whose building is the oldest in that city, dating back to 1684. It is also the name of a famous seminary for priests in Paris, France.

SAINT SWITHIN: an English prelate of the 9th c. He was ordained to the priesthood in 830, was charged with the education of Prince (afterward king) Alfred, and in 852 was made bishop of Winchester. He died about ten years later. He was canonized a century later. The popular knowledge of this saint's name is due to the belief that if rain falls on July 15 (which is popularly known as Saint Swithin's Day) it will rain for six weeks after. This notion is said to have arisen from the fact that when the bones of Saint Swithin were about to be removed, after his canonization, from their original resting-place in Winchester church-yard to the interior of the cathedral, their removal, which was to have taken place on July 15, was delayed for 40 days by the excessive rains which fell uninterruptedly for that period.

SAINT THOMAS: one of the Virgin Islands, Danish West Indies, lying 43 m. e. of Porto Rico; area 33 sq.m. The surface is hilly, and only a small portion of the land is cultivated; sugar, cotton and vegetables are raised. Earthquakes are frequent but not as destructive as the severe hurricanes, which have several times done a con-

INTERIOR OF THE MOSQUE, ST. SOPHIA.

siderable amount of damage in the island. Saint Thomas was once of great commercial importance; its capital, Charlotte Amalie, was at one time one of the chief emporia of the West Indies. Since the introduction of steam vessels, and especially since 1885, its trade has greatly declined, and Barbados has taken its place as a trade center. Charlotte Amalie is still of importance as a coaling station, and is a port of call for steamers. The island was first colonized by the Dutch, was held by Great Britain in 1667-71, 1801, and 1807-15, and finally came into the possession of Denmark. In 1870 negotiations were made for its purchase by the United States, but congress refused to ratify the treaty; it was also included in the treaty of 1902 for the purchase of the Danish West Indies by the United States, which was rejected by the Danish Folkething. Pop. (1901) 11,012.

SAINT THOMAS: Canada, city and county-seat of Elgin co., Ontario; on the Canadian Pacific, Grand Trunk, Michigan Central, Wabash, and Lake Erie & Detroit River railways; 75 m. s.w. of Hamilton, and 9 m. n. of Port Stanley on Lake Erie. It is one of the most important railway centers in southern Ontario, is the receiving and distributing center for a rich fruit and farming country, and has an extensive local and export trade. The Michigan Central railway has large car-building and machine shops here, employing many men, and there are important manufactures of foundry products, farm implements, carriages and wagons, mattresses, brooms, churns, blocks and tackle; flax, flour, and planing mills, and breweries. Saint Thomas has gas, electric lights, and water-works; fine county buildings, city hall, and market; handsome residences, schools, and churches; and hotels, banks, and daily and weekly newspapers. Pop. (1901) 11,485.

SAINT THOMAS (Port. SAN THOMÉ, *sän tomā*): West Africa; a volcanic island in the Gulf of Guinea, 170 m. w. of the mouth of the Gabun river, belonging to Portugal. It contains an area of 360 sq.m., and its highest peak, Saint Anna, rises from the center of the island to a height of about 7,000 feet. The valleys are fertile but unhealthful; the elevated portions, swept by fresh breezes, are, on the contrary, salubrious. The chief products are coffee and cocoa, cotton, sugar, indigo, sweet potatoes, dates, etc. There are large numbers of domestic animals. Saint Thomas, on the northeast coast, is the seat of a bishop, and the chief town. The island was discovered by the Portuguese on Saint Thomas Day, 1471, and was colonized in 1493. The Dutch occupied it from 1641 to 1844. With the island of Principe it forms a province administered by a governor. Pop. of Saint Thomas (1900) 37,776; of Principe 4,327.

ST. THOM'AS, CHRISTIANS OF. See CHRISTIANS OF ST. THOMAS.

ST. UBES. See SETUBAL.

SAINT VALENTINE'S DAY: the 14th of February, so called after a Christian martyr of the Roman period. The custom peculiar to the day of exchanging missives of affection and love, is believed to have been handed down from the Roman festival of the Lupercalia, celebrated in the month of February, when the names of young women were put into a box, and drawn out by men as chance directed. For many centuries, if not up to the present time in certain remote districts, Saint Valentine's Eve was celebrated in a manner very similar to the fashion of Roman heathen times, maids and bachelors throwing billets with their names on into a receptacle, and drawing therefrom by chance the name of some one of the opposite sex, who became thereupon for the year following the 'valentine,' or chosen companion, of the other more or less lucky individual. The sending of valentines by message or mail is one outgrowth of the custom formerly prevalent. To this has been superadded the sending of cheap and often scurrilous caricatures and verses, to persons whom it is sought to annoy. On the other hand, the custom has expanded in a more pleasant direction in the presentation of affectionate valentines by parents to children, and children to parents, and husbands and wives to each other. In genial climates Valentine's Day is about the mating period of birds, and this is supposed to have had something to do with the origin of the customs with which the day is associated.

SAINT-VICTOR, JACQUES BENJAMIN MAXIMILIEN, Comte de: West Indian author; b. Fort Dauphin, Santo Domingo, 1770, Jan. 14; d. Paris, France, 1858, Aug. 8. He was educated at the College of La Fleche, France, and entered journalism. During Napoleon's reign he was on the staff of *Journal des Débats,* and after 1815 he established several Roman Catholic and royalist magazines. He revisited his native land in 1830, spent two years in the United States and then made a tour of the West Indies. He wrote: *Tableau historique et pittoresque de Paris depuis les Gaulois jusqu'à nos Jours* (1808-12); *Lettres sur les Etats-Unis ecrites en 1832-3* (2 vols. 1835); *Journal de Voyage* (2 vols. 1836); etc.

SAINT-VICTOR, PAUL BINSSE: French author; b. Paris, 1828, July 11; d. 1881, July 9. He first made himself known as a dramatic and art critic, but soon rose to eminence as a student of the drama and of art and a permanent contributor to the literature of these subjects. His best known books are: *Men and Gods* (1867-72); and *The Two Masques* (1880-3). He has also written: *The Women of Goethe* (1869), and *The Theatre of To-day* (1889).

ST. VINCENT, *sānt vĭn'sĕnt:* one of the Brit. islands in the W. Indies, 100 m. w. of Barbadoes; one of the Windward group; 18 m. in extreme length, 11 m. wide; 132 sq.m. The island is one of the most beautiful of its

group. It is traversed from n. to s. by a chain of volcanic mountains, which rise in the volcano called the Souffriere, 3,000 ft. Many valleys are fertile, and the shores are rich and productive. Value of total imports yearly averages $750,000; exports about $780,000; the principal export being sugar. Vessels having a total tonnage of 118,433 tons entered and cleared the ports. Chief port, and capital of the island, Kingston. Pop. of island 44,600.

ST. VIN'CENT, Cape (Portuguese *Cabo da São Vicente*): promontory forming the s.w. corner of Portugal and of Europe; off which several important naval battles have taken place. 1693, June 16, Admiral Rooke, with 20 English men-of-war, was here attacked by a vastly superior French fleet, and defeated with the loss of 12 men-of-war, and 80 merchantmen under his convoy. 1780, Jan. 16, Admiral Rodney here destroyed several Spanish ships; 1797, Feb. 14, the great battle of Cape St. Vincent, between 15 British line-of-battle and 6 frigates, under Admiral Jervis (afterward Earl St. Vincent), and 27 Spanish line-of-battle and 12 frigates, resulted in the total defeat of the Spanish.

ST. VIN'CENT, Earl of. See Jervis, John.

ST. VI'TUS'S DANCE. See Chorea.

SAIONJI, Marquis Kimimochi: prime minister of Japan: b. 1849, at Kyoto, the son of a noble standing high at court. His ability in statesmanship was early manifest, and at the age of 16 he participated in the councils that rehabilitated the imperial authority. Directly after, he was given command of an army dispatched to the coast of the Sea of Japan to subjugate rebellious provinces. In 1869 he was sent to France to become proficient in western learning, and as he was in Paris at the time, and an eye-witness of the scenes and events attending the commune and the German occupation in 1870, his experiences were of a kind not generally given to foreigners. Returning to Japan in 1880, fully imbued with democratic ideals, he started a newspaper for the propagation of his opinions, but conducted it but a short time, giving it up in deference to the advice of his conservative associates. He became a junior member of the advisory board of the Emperor, and from 1881 has been constantly in official employment, having filled the Austrian and German missions as representative of his government. After varied service in the various ministries from 1896 on, in 1906 he was appointed prime minister, when the Katsura ministry failed because of the general discontent with the terms of peace after the Russian war.

SAIS, *sā'ĭs:* ancient Egyptian city, called in the hieroglyphics *Sa,* and existing at the time of the old monarchy; on the right bank of the Canopic branch of the Nile; 31° 4′ n. lat. It is at present called Sa el Hagar, or Sa of the Stone, from some modern stone buildings in

the neighborhood. Traces of the Temenos, 720 ft. long, remain, and of the citadel; but the temples and tombs which stood within the city walls have been completely stripped; many fine statues of basalt of the 26th or Saite dynasty, from this spot, being found in the different collections of Europe. Sais gave its name to a nome, also to two Egyptian dynasties, the 24th and 26th, founded by natives of the city. The goddesses principally worshipped there were Neith or Minerva, and Ceres or Isis. Neith was said to be mother of the sun, and is constantly called in the hieroglyphical legends the mistress of Sais. Sais was important as a religious capital. Toward the decline of the monarchy, it rose to great splendor. The 26th dynasty transferred hither the capital of the kingdom. Amasis transported a monolithic shrine of granite from Elephantine to Sais, with three years' labor of 2,000 men. Solon and Pythagoras visited Sais and Plato was instructed in its colleges. There seems to have been a considerable Greek population in the city; but though Sais continues to be mentioned after the 26th dynasty, its political importance then declined, and Memphis became the seat of government. The intercourse between Sais and Athens subsequently gave rise to the idea of Athens having been colonized from it.

SAITH, or SEATH, or SETH, n. *sāth* [Icel. *seid*, the coal-fish]: a coarse sea-fish; the coal-fish; the young fry are called *silliks* or *sillocks;* in the second year they are called *cuths.*

SAIVAS, *sī'vaz:* one of the three great divisions of Hindu sects (see INDIA). The word designates the votaries of S'iva, and comprises different special sects, which varied in number at different periods of mediæval Hinduism. The number of shrines dedicated to S'iva in his form as Linga make the Linga worship seem most prevalent of all; but these temples are seldom the resort of numerous votaries, and they have little veneration from the Hindus. The worship of S'iva seems from a remote period more that of the learned and speculative classes than of the masses of the people. In Upper India the worship of S'iva has, indeed, never assumed a popular form.

The principal present divisions of the Saivas are the following.—The *Dan'd'ins,* or staff-bearers, properly are representatives of the fourth order, or mendicant life, into which a Hindu is to enter after passing through the stages of a religious student, householder, and hermit. The Dan'd'in is distinguished by carrying a *dan'd'a,* or small staff, and a piece of cloth dyed with red ochre—in which the Brahmanical cord is supposed to be enshrined—attached to it. He shaves his hair and beard, wears only a cloth round his loins, and subsists on food obtained ready-dressed from the houses of the Brahmans once a day only, which he deposits in the small clay-pot that he always carries with him. The *Das'nâmi-Dan'd'ins,* included in

this class, admit none but Brahmans into their body. The philosophical tenets of this sect are mainly those of the *Vedânta* (q.v.), as taught by S'ankara and his disciples; but they generally superadd the practice of the *Yoga* (q.v.), and many have adopted the doctrines of the *Tantras* (q.v.). The *Yogins* are, properly speaking, followers of the *Yoga* (q.v.) system; and the term implies a class of men who practice the most difficult austerities, in order to become absorbed into the universal spirit, and thus liberated from repeated births. The votaries of S'iva, so called, hold that, by dint of these practices—such as continued suppressions of espirations, sitting in 84 different attitudes, fixing the eyes on the top of the nose—they will be finally united with S'iva, whom they consider as the source and essence of all creation. They may be of any caste; they live as ascetics, single or in colleges; officiate as priests of S'iva in some places; mark the forehead with a transverse line of ashes, and smear the body with the same substance; they deal in fortune-telling, profess to cure diseases with drugs and spells; and some play and sing, and exhibit animals. The *Jangamas*, or *Lingavats*, are characterized by wearing the Linga emblem on some part of their dress or person.

The *Paramahansas* are ascetics who pretend to be solely occupied with the investigation of Brahman, and to be equally indifferent to pleasure or pain, insensible of heat or cold, and incapable of satiety or want. In proof of this they go naked in all weathers, never indicate any natural want, and receive from their attendants what is brought to them as their alms or food. The Aghorins pretend to the same apparent worldly indifference; but they seek occasions for its display, and demand alms as a reward. Their practices seem to betray that their worship was not originally inoffensive, but required human victims. They eat and drink whatever is given to them, even ordure and carrion; and to extort money from the credulous, they resort to the most disgusting devices. The *Urdhabâhus* are solitary mendicants; they extend one or both arms above their heads till they remain of themselves thus elevated. They also close the fist, and the nails being suffered to grow, completely perforate the hand. They usually assume the S'aiva marks, and twist their hair so as to project from the forehead, in imitation of the matted hair of S'iva. The *Âkâs'mukhins* hold up their faces to the sky till the muscles of the back become contracted and retain it in that position. The peculiarities of the other sects are equally trifling, and sometimes disgusting.—See Wilson, *Sketch of the Religious Sects of the Hindus* (1862); Monier Williams, *Religious Thought and Life in India* (1883); Barth, *Religions of India* (transl. 1882).

SAJENE, or SAGENE, n. *sa-jēn'* [Rus.]: Russian measure of length, equal to 1·167 English fathoms, or about 7 English feet.

SAJOU see SAPAJOU.

SAKA, n. *sā'ka:* native name of the bastard purple heart-tree of Demarara, a species of *Copaifera pubiflora* and *C. bracteata*, which yield timber of great toughness, used in making furniture.

S'Â'KA: see S'ÂLIVÂHANA.

SAKALIN': see SAGHALIN.

SAKATAYANA, *sâ-ka-tâ'ya-na:* renowned Hindu grammarian, who preceded Pân'ini (q.v.) and Yâska (see NIRUKTA), for he is quoted by both these authors. His grammatical work, however, seems to be lost; and a recent attempt to identify with it a grammar of a Sâkatâyana who is a later and probably modern writer, has signally failed.

SAKE, n. *sāk* [AS *sacu*, contention, lawsuit: Low Ger. *sake*, suit at law; *saken*, to complain: Ger. *sache*, a complaint, an affair: Dut. *zaak*, cause, matter]: final cause; end: purpose of obtaining; regard to any person or thing.

SAKE, *sā'kĭ:* kind of beer made from rice; the common alcoholic liquor of Japan. It is clear, and has a peculiar taste, to Europeans generally unpleasant. The Japanese usually heat it before drinking, and pour it into flat cups of lacquered wood. It produces a quick and transient intoxication. See ARRACK.

SAKER, n. *sā'kêr* [F. *sacre;* It. *sagro*, a saker—from Arab. *çaqr*]: a hawk; a species of falcon; *formerly*, a small cannon. SA'KERET, n. *-ĕt*, the male of the saker hawk.

SAKHRAT, n. *sak-răt'* [Arab, a rock, a hewn stone]: in *Mohammedan myth.*, sacred stone of emerald color, which, by reflection, imparts the azure hue to the sky. If one possess the smallest fragment of it, he acquires miraculous powers.

SAKI, *sā'kĭ* or *săk'ĭ* (*Pithecia*): genus of American monkeys, having the tail, which is not prehensile, covered with very long hair, whence they are often called *Fox-*

Saki Cuxio.
(*Pithecia satanas*).

tailed Monkeys. The head is round, and the muzzle short, the ears not unlike those of the human race. The whole body is covered with long hair.

SAKIEH, n. *săk'ĭ-ĕh*, or SAKIAH, or SAKEEYEH [Arab. *saka, sakka*, a water-carrier, a cupbearer]: a machine used in Egypt for raising water from the Nile for irrigation; a modification of the Persian wheel.

S'ÂKTAS, *sâk'taz:* one of the great divisions of Hindu sects (see INDIA). The term is from Skr. *s'aki*, 'power, energy;' but, in its special application, the energy of the deity, particularly of the gods of the Hindu triad, Brahma, Vishn'u, and S'iva. This energy, originally spoken of as the wish or will of the Supreme Being to create the universe, and afterward dilated upon in metaphorical and poetical speech, came to assume at the Pauranik period (see INDIA, *Hindu Religion*) the form of a separate deity, thought of as wife of the god to whom it belongs. Accordingly, Saraswatî (q.v.) became the S'akti or wife of Brahman; Lakshmî (q.v.), the S'akti or wife of Vishn'u; and Devî, or Durgâ, or Umâ (q.v.), the S'akti or wife of S'iva. *S'âkta*, properly speaking, means, therefore, a worshipper of any of these female representations of the divine power; but, in its special and usual sense, it is applied to the worshipper of the female energy or wife of S'iva alone; and the S., properly so called, are, therefore, the votaries of Durgâ, or Devî, or Umâ (q.v.). Since S'iva (q.v.) is the type of destruction, his energy or wife becomes still more the type of all that is terrific; and, in consequence, her worship is based on the assumption that she can be propitiated only by practices which involve destruction of life, and in which she herself delights. Such a worship, leading to brutalization, and degenerating into grossest licentiousness—caused the S'âkta religion to become the worst of all forms which the outrageous aberrations of the Hindu mind assumed. It prevails especially in Bengal, among the lower classes. The works from which its tenets and rites are derived, are known as *Tantras* (q.v.); but as in some of these works the ritual enjoined does not comprehend all the impure practices recommended in others, the sect became divided into two leading branches, *Dakshin'âchârins* and *Vâmâchârins*—the last, the type of the S., carrying impurity to its extreme, in their ritual, especially the branch called Kaula or Kulîna. Their object is, by reverencing Devî, who is one with S'iva, to obtain supernatural powers in this life, and to be identified after death with S'iva and his consort. The forms vary according to the immediate object of the worshipper. Prof. Wilson says: 'Where the object of the ceremony is to acquire an interview with, and control over, impure spirits, a dead body is necessary. The adept is also to be alone, at midnight, in a place where bodies are burned or buried, or criminals executed; seated on the corpse, he is to perform the usual offerings; and if he does so without fear, the Bhûtas, the Yoginîs, and other male or female goblins, become his slaves. All the principal ceremonies comprehend the worship of S'akti, and require the presence of a female as the living representative and type of the goddess. This worship is mostly celebrated in a mixed society, the men of which represent Bhairava, and

the women, Bhairavî. The S'akti is personated by a naked female, to whom meat and wine are offered, and then distributed among the assistants; and the worship is terminated with the most scandalous orgies among the votaries. The members of this sect are very numerous, especially among the Brahmanical caste; all classes are, however, admissible, and equal at the ceremonies of the sect. The particular insignia of these S'âktas are a semicircular line or lines on the forehead, of red sanders or vermilion, or a red streak up the middle of the forehead, with a circular spot of red at the root of the nose. They use a rosary made of the seeds of the eleocarpus, or of coral beads.'—See H. H. Wilson, *A Sketch of the Religious Sects of the Hindus* (1862); Monier Williams, *Religious Thought and Life in India* (1883).

S'AKUNTALA, *sâ-kôn'ta-la:* one of the female characters in Hindu mythology. She is mentioned as a water-nymph in the *Yajurveda* (see VEDA), and is the subject of an episode of the *Mahâbhârata* (q.v.); but her name has become known in Europe through the drama of Kâlidâsa (q.v.), which, introduced by Sir William Jones 1789, became the starting-point of Sanskrit philology in Europe. The legend of S. in the *Mahâbhârata*, presents her as daughter of the saint Vis'wa'mitra (q.v.) and the Apsaras, or water-nymph, Menakâ. Abandoned by her parents, she was adopted by the saint Kan'wa, who brought her up in his hermitage as his daughter. King Dushyanta, hunting in the forest, came to the hermitage, and fell in love with S., persuading her to marry him according to the rite of the Gandharva marriage, and promising her that the son she would bear him should be the heir to his throne, and that he would take her home as his queen to his royal city. In due time her son was born, and they remained at the hermitage until he was six years old; but as Dushyanta did not send any messenger for her, Kan'wa directed her to proceed with her boy to his palace. When she arrived there, she was repudiated by the king, who could not recognize her because of a curse which was upon her from a wrathful saint who, as a visitor at the hermitage, had deemed himself neglected by S. At last a heavenly voice assured the king of S.'s truth, and he recognized her as his queen, and her son as his heir. There are two versions of this drama; of the latter a good ed. was pub. at Calcutta 1864. The first Eng. transl. of the older version was by Sir William Jones (Cal. 1789): the second was by Prof. M. Williams (Hertford 1856); it renders the metrical part of the original with consummate taste. Among German, Italian, Danish, and other translations of this drama, the German by Ernst Meyer (Stutt. 1852) is worthy of especial notice.

S'ÂKYAMUNI, *sâk'ya-mû'nĭ*, or the SAINT S'ÂK'YA: a name of *the* Buddha, founder of the Buddhist religion. see BUDDHISM.

SAL, *săl* [L. *sal*, salt]: a common prefix among the older chemists, denoting a compound having definite proportions of an acid with an alkali, an earth, or a metallic oxide. SAL-MIRABILE, *-mĭ-răb ĭ-lē* [L. wonderful salt]: Glauber's salt; sulphate of soda. SAL PRUNELLA, *prō-nĕl'lă*, a name given to nitre when fused and cast into cakes or balls. SAL VOLATILE, *vŏl-ăt'ĭl-ē* [L volatile salt]: the volatile salt; a solution of the carbonate of ammonia, and popularly pronounced *săl vŏl'ăt-ĭl:* see SALTS, SMELLING.

SAL, or SAUL, n. *sawl* [native name]. Indian timber tree valuable for building and engineering purposes, and yielding a resin called dammar; the *Shorēă robusta*, ord. *Dipterocarpăceæ*.

SALA, *sā'la*, GEORGE AUGUSTUS HENRY: English author: b. London 1828; son of an Italian father and a popular English singer. He was, from an early age, a contributor to magazines, and much of the time the travelling and war correspondent of journals, such as the *Daily Telegraph*. *Temple Bar Magazine* was founded and edited by him. On his second visit to the United States 1885, he lectured in many cities. The titles of his works indicate his travels: *Journey due North* and *Residence in Russia* (1859); *A Narrative of the Rhine* (1860); *Dutch Pictures* (1861); *America in the Midst of the War* (1864); *Trip to Barbary* (1865); *From Waterloo to the Peninsula* (1864); *Notes and Sketches of the Paris Exposition* (1868); *Rome and Venice* (1869); *Under the Sun* (1872), scenes in tropical countries; *America Revisited* (1882); *A Journey due South* (1885); etc. Besides these he published novels and imaginative sketches, such as, *How I Tamed Mrs Cruiser* (1858); *The Dumb Poor Porter* (1862); *Strange Adventures of Captain Dangerous* (1863); *Quite Alone* (1864); *Wat Tyler, M.P.*, a burlesque (1869). He d. 1895, Dec. 8.

SALAAM, or SALAM, *sâ-lâm'* [*selám*, Arab. = Heb. *shalom*, peace]: general term of salutation among Mohammedans, who are very formal in their social manners, though their demeanor and conversation are quite unrestrained among both men and women. Several of their social formalities are founded on religious precepts; among these is the custom of greeting each other with the words (forbidden to be used with non-Mohammedans) 'Es-selámu aleikum' (Peace be with you), which is answered by: 'With you be peace, and the mercy of God, and His blessings!' Generally the rider salutes the person on foot, the passer-by those who sit down or stand still; the smaller party salutes the larger, the young the older, etc. Salutation is to be the first and the last thing on entering a house. The following is the rising scale of the different modes of obeisance with the Moslem: 1. Placing the right hand on the breast; 2. Touching the lips and the forehead or turban (or forehead and turban only) with the right hand; 3. The same, but slightly inclining the head during that action; 4. The same, but inclining the body also; 5. The same, previously touching the ground with the right hand; 6. Kissing the hand of the person to whom the obei-

sance is paid; 7. Kissing his sleeve; 8. Kissing the skirt of his clothing; 9. Kissing his feet; 10. Kissing the ground —to be understood (against De Sacy) as merely touching the ground previous to touching the lips and forehead with the right hand. The first five modes are accompanied by the 'Peace be with you,' and the reply given above. The sixth mode is observed by servants or pupils to their master, wife to husband, and children to father, and sometimes mother, by the young to the aged, and the less learned to the learned and pious (Lane, *Notes to Arab. Nights*, etc.).

SALACIOUS, a. *sa-lā'shŭs* [L. *salax* or *salācem*, lustful —from *salīrĕ*, to leap: It. *salace*, libidinous]: lustful; lecherous. SALA'CIOUSLY, ad. *-lĭ*. SALA'CIOUSNESS, n. *-nĕs*, or SALACITY, n. *sa-lăs'ĭ-tĭ*, lust.

SALAD, n. *săl'ad* [F. *salade*—from O. It. *salata*, a salad —from L. *sal*, salt: It. *insalata;* Ger. *salat*, a salad]: certain vegetables, usually seasoned, eaten raw as a relish with other food: named from the fact that salt is one of its chief ingredients. The principal salad herbs are lettuce, endive, chicory, celery, mustard, and cress: water-cress, onions, radishes, chervil and a few savory herbs used to give flavor. They are usually cut up, and mixed with salt, vinegar, oil, and other condiments, according to taste. Sugar often is added. Cresses, seed-leaves of mustard, etc., are often eaten without any addition. Salad has always been a favorite food with civilized nations. The Romans made it thus: Cultivated endive was cut small after careful washing and draining, then gravy and oil were poured over it; and finely minced onions were strewed over the whole; then a little vinegar and honey were added, and the salad served up. The great value of salads is in the fact that being uncooked, they contain more mineral matter, such as potash, soda, etc., than if boiled. Salads are prepared also with animal food, e.g., boiled lobsters, crabs, eggs, etc. SAL'ADING, n. vegetables for making a salad. SALADE, n. *săl-âd'*, a pickle made of onions, cucumbers, and apples, with salt, Cayenne pepper, white wine, and the sauce 'soy,' and which may be used the same day as made. SALAD-DAYS, in *OE.*, days of inexperience. SALAD-OIL, olive-oil used for dressing salads, and for culinary purposes; in *familiar language*, a flogging.

SALADIN, *săl'a-dĭn:* name given by western writers to SALAH-ED-DIN YUSSUF IBN AYUB: sultan of Egypt and Syria, and founder of the Ayubite dynasty in those countries: 1137–93; b. at Tekreit, town on the Tigris, of which his father Ayub was gov. under the Seljuks: he reigned as sultan, about 1174–93. As the great Moslem hero of the third crusade, and the beau-ideal of Moslem chivalry, he is an interesting character. He belonged to the Kurdish tribe of Ravad. Following the example of his father and uncle, he entered the service of Noureddin (q.v.), prince of Syria, and accompanied his uncle in his various expeditions to Egypt in command of Noureddin's army. S. was at this time much addicted to wine and gambling, and it was not till, at the head of a small detachment of the Syrian

army, he was beleaguered in Alexandria by the combined Christians of Palestine and Egyptians, that he showed any qualities of a great captain. On the death of his uncle, Shîrkoh, S. became grand-vizier of the Fatimite caliph; but the Christians of Syria and Palestine, alarmed at the elevation of a Syrian emir to supreme power in Egypt, made a combined attack on the new vizier. S. foiled them at Damietta, and transferred the contest to Palestine, taking several fortresses, and defeating his assailants near Gaza; meanwhile also skilfully allaying his master Noureddin's jealousy of his talents and ambition. On Noureddin's death 1174, S. began a struggle with his successor, which ended in his establishing himself as the sultan of Egypt and Syria, a title confirmed to him by the caliph of Bagdad. The plundering by the Christians of a rich pilgrim caravan on its way to Mecca, an infringement of the treaty with S., brought down his vengence on them; their army suffered a dreadful defeat at Tiberias (1187, July 4); the king of Jerusalem, the two grand-masters, and many other warriors of high rank were taken captive; Jerusalem was stormed (Oct. 2). and almost every other fortified place in Palestine was taken. The news of this great success of the Mohammedans aroused the furious zeal of western Europe; and a powerful army of crusaders, headed by the kings of France and England, speedily appeared on the scene of strife. They captured Acre 1191; and Richard Cœur-de-Lion, at the head of that portion of the crusading army which adhered to him, continued the war with success, twice defeated S., took Cæsarea and Jaffa, and finally obtained a treaty for three years 1192, Aug., by which the coast from Jaffa to Tyre was yielded to the Christians. In the following year, S. died at Damascus of a disease under which he had long suffered. S. was not a mere soldier; his wise administration left traces for centuries. In him the warrior instinct of the Kurd was united to a high intelligence; and even his opponents attribute to him many of the noble qualities of mediæval chivalry, invincible courage, inviolable fidelity to treaties, greatness of soul, piety, justice, and moderaton.

The Ayubite dynasty, of which he was founder, ruled Syria till 1259, when it was dispossessed by the Perso-Mongols, and over Egypt till the rise of the first Mameluke kingdom under Ibeg 1250.

SALADINE-TENTH, n. *săl'a-dĭn-:* in *law*, tax imposed on England and France, 1188, by Pope Innocent III., to obtain money for the crusade to be led by Richard I. of England and Philip Augustus of France against Saladin, Sultan of Egypt. This tax became the ground for taxing ecclesiastical benefices for the pope. The example was ultimately imitated by various sovereigns.

SALADO, *sâ-lâ'dō*, RIVER: South American river, rising in one of the spurs of the Andes, and flowing s.s.e. in the Argentine Republic about 600 m. to the Parana', which it enters near Santa Fé. It is navigable for small vessels for a large part of its course.

SALÆRATUS. See SALERATUS.

SALAL-BERRY, n. *sa-lăl'bĕr'rĭ:* the berry of *Gaultheria Shallon.* It is about the size of a common grape, and grows in the valley of the Columbia river, Oregon.

SALAM. See SALAAM.

SALAMANCA: N. Y.; village in Cattaraugus co., on the Allegheny river, and on the Lake Erie & Western, the Buffalo, Rochester & Western, and the Western New York & Pennsylvania railroads; 54 m. s. of Buffalo. It was incorporated as a village in 1878. The lumber business is the chief industry, and there are several saw and planing mills; the village also has a tannery, wire-mattress factory, cigar factories, an embroidery factory, and railroad machine shops. Pop. (1890) 3,692; (1900) 4,251.

SALAMANCA, *sâ-lâ-mân'kâ:* one of the three modern provinces of Spain, into which the ancient kingdom of Leon was divided; about 4,940 sq.m. Pop. 320,800.

SALAMAN'CA: famous town of Spain, capital of the modern province of Salamanca; on three rocky hills on the right bank of the Tormes, 50 m. e.n.e. of Ciudad Rodrigo. Prior to its almost total destruction by the French 1812, it was renowned for the number of its splendid edifices and institutions, and even yet it is a rich mine for the architect, abounding in magnificent specimens of simple and florid Gothic, as well as of the richest cinque cento. It is surrounded by a wall, pierced with nine gates, and a part of which is very old. The narrow, crooked, dark, and steep streets, containing many old and stately structures, residences of the old nobility, give the town an antique and venerable look. Besides the old cathedral, a simple and massive edifice, there are five other churches of the 12th c. The new cathedral, begun 1513, is a magnificent structure in florid Gothic, in whose adornment painting, gilding, and sculpture have been largely and successfully used. At the close of the 18th c. Salamanca contained 27 parish churches, 39 convents, 25 colleges. Of the colleges, 20 were destroyed by the French while the town was in their possession, as well as about 20 of the convents, for the purpose of obtaining materials for the erection of fortifications, and for firewood. The University of Salamanca, with which the University of Palencia was incorporated 1243, was founded 1200: it consisted of a number of colleges, divided into *Mayores* and *Menores,* or larger and smaller colleges. Of the former, there were only six in Spain, and four of these were at Salamanca; the other colleges were 21 in number. The library, according to the most recent statements, contains 30,000 vols. and 1,500 MSS. Pop. 25,000.

Salamanca, the ancient *Salmantica,* was a Roman *municipium.* In the vicinity was won one of the most famous victories of the Peninsular war, by the British under Wellington against the French under Marmont, 1812, July 22.

SALAMANDER, n. *săl'ă-man'dĕr* [F. *salamandre*—from L. or Gr. *salamandra*]: fabulous animal in mediæval superstition, said to be able to live in fire; it was supposed to have the shape of a man: in *zool.*, an amphibian allied to the newt (see below). S. denotes also a large iron poker; an iron plate employed for cooking purposes. SAL'AMAN'-DRINE, a. *-drĭn*, pertaining to a salamander; enduring fire. SALAMANDER'S HAIR, amianthus and asbestos.

SALAMAN'DER (*Salamandra*): genus of Batrachians of family *Salamandridæ*, to which Newts (q.v.) also belong. The name is, indeed, sometimes extended to the whole family; newts being called *Aquatic Salamanders*, and the name *Terrestrial S.* being given to this genus, the species of which inhabit water in only their tadpole state, and return to it only to deposit their eggs, generally living in moist places, as under stones, roots of trees, etc. The general form is very similar to that of newts, but the tail is round, not flat as in newts. Several species are found in Europe. The SPOTTED S. (*S. maculosa*), six or eight inches long, black, with bright yellow stripes on its sides, and

Spotted Salamander (*S. maculosa*).

livid blue beneath, is widely spread throughout Europe. The BLACK S. (*S. atra*) is much smaller, black, the body and tail ringed, the tail almost as if formed of beads. It is abundant in the Alps and mountains of s. Germany. Other species are found in Spain, Italy, etc.; Asia and N. America also have numerous species. The most remarkable N. Amer. species is the *Amblystoma mavortium*, occurring 4,000—9,000 ft. above the sea from Montana to Mexico. Its larval form, which in some localities or circumstances it retains through life, is larger and different both in appearance and anatomy, and was described as a distinct species, *Siredon lichenoides*. The Tiger S. of the prairies is about 10 in. long and spotted; it is often found in cellars and fields, and is called mud-puppy, a name given also to the large *Menopoma* or 'hellbender,' and to the *Menobranchus* of the lakes. The largest known is the Japanese S., which grows to more than 3 ft. in length. Our common small land S. is *Plethodon erythronotum*, red-spotted and sometimes wholly bright red. The name S. extends to all the tailed batrachians of the order *Urodela*, though usually restricted to those that have no persistent gills, but breathe by lungs. Salamanders feed on worms,

slugs, snails, and insects. They are inert and sluggish creatures, and timid to the utmost extent that their stupidity permits. The brain is very small. They are perfectly harmless, though exuding, when alarmed, from pores on the back and sides, a milky humor, which is injurious to very small animals. But they have long had, and still retain, a popular reputation of extreme venomousness, and are therefore objects of utmost dread to the vulgar in almost all countries which they inhabit. Strange fables have been current concerning them from remote ages, particularly as to their ability not only to endure fire without burning, but to extinguish fire.

SALAM'BA: the native Filipino name for a kind of fishing apparatus, used near Manila, fitted on a raft composed of several tiers of bamboos. It consists of a rectangular net, two corners of which are attached to the upper extremities of two long bamboos, tied crosswise, their lower extremities being fastened to a bar on the raft, which acts as a hinge; a movable pole, arranged with a counterpoise as a sort of crane, supports the bamboos at the point of junction, and thus enables the fishermen to raise or depress the net at pleasure. The lower extremities of the net are guided by a cord, which, being drawn toward the raft at the same time that the long bamboos are elevated by the crane and counterpoise, only a small portion of the net remains in the water, and is easily cleared of its contents by means of a landing net.

SALAMIS, *săl'a-mis* (modern name, *Koluri*): irregularly shaped, mountainous island of Greece, off the coast of Attica, and forming with it the Bay of Eleusis. Its area is about 30 sq.m., and it has a population of about 4,000, the chief town being Koluri, on the west coast. It had anciently two principal towns, Old and New Salamis, the former on the s. and the latter on the n.e. coast. Salamis is remembered chiefly for the great naval battle between the Greeks and Persians (B.C. 480) a few days after the battle of Thermopylæ, in the narrow strait between the east coast of Salamanca and the west coast of Attica. The Grecian fleet, of about 360 vessels, was drawn up at the entrance of the bay forming the harbor of New Salamanca, Themistocles being leader of the Athenian contingent, and Adimantus of the Corinthian, while the whole was under the command of the Spartan Eurybiades. Great dissensions prevailed among the Grecian leaders, which would probably have led to a general break-up, had not Themistocles by a stratagem induced Xerxes, King of the Persians, to bring up his fleet, and give immediate battle to the Greeks. Xerxes drew up his ships, numbering at least 1,000, during the night previous to the battle, opposite the Grecian fleet, along the coast of Attica, almost completely blocking up both entrances to the straits; and confident of victory if he himself superintended operations, he took his seat on a throne erected on a lofty height on the Attic coast, almost oppo-

THE VICTORS OF SALAMIS.

site New Salamanca. Both Greeks and Persians fought with great bravery, but the latter were entirely defeated, owing, perhaps, chiefly to their immense, unwieldy fleet being compressed into so small a space, which rendered it almost unworkable, and completely at the mercy of their opponents. The only name mentioned on the Persian side with distinction is that of Artemisia, Queen of Halicarnassus, who is said to have fought with desperate bravery. The loss of the Greeks is said to have been 40 ships, and that of the Persians 200 ships, exclusive of those captured.

SALAMMBO, *sâ-lâm-bō':* a historical romance by Gustave Flaubert, published in 1864. It resulted from the author's visit to the ruins of old Carthage, and is a kind of revivification of the ancient capital and its people. The scenes testify to the great erudition of the author, but critics complain that the picture has too little perspective. All is painted with equal brilliance—matter essential and unessential.

SALAMSTEIN, n. *sa-lâm'stīn* [Ger. *stein,* a stone], also SAL'AM-STONE, n. *-stōn:* a name applied to the blue or oriental sapphire from Ceylon.

SALARY, n. *săl'a-rĭ* [F. *salaire;* It. *salario,* salary—from L. *salarĭum,* salt money given to Roman soldiers and officials—from *sal,* salt]: a fixed sum paid to a person for his services, yearly, half-yearly, or quarterly: V. to fix or pay a salary to. SAL'ARIED, a. *-rĭd,* having a salary; receiving a salary.—SYN. of 'salary, n.': pay; wages; stipend; allowance; hire; recompense.

SALARY GRAB: in American history, the popular name for the general increase in federal salaries in 1873. The constitution provides for the compensation of the President, senators, representatives, justices and federal officers from the federal treasury. The act of 1873, Mar. 3, provided that the President's salary be increased from $25,000 to $50,000, that of the chief justice from $8,500 to $10,500, those of the Vice-President, cabinet officers, associate justices and speaker of the house from $8,000 to $10,000, and of senators and representatives from $5,000 to $7,500. Another act 1873, Mar. 4, was retroactive as regarded the salaries of members of congress during the previous two years. This, the essence of the 'salary grab,' excited so much indignation that the laws were repealed, except those affecting the salaries of the President and justices.

SALAWATTI, *sâ-lâ-wâ'tē:* a Melanesian island off the western coast of New Guinea, covering an area of about 750 sq.m. A chain of chalk cliffs, rising to a height of 2,500 feet, skirts the northern coast; the remaining portion is a deep valley covered with virgin forests. Salawatti was discovered by Watson in 1764. It is regarded as belonging to Dutch New Guinea. Pop. (est.) 5,000 to 6,000.

SALDAN'HA BAY: see CAPE OF GOOD HOPE.

SALE, n. *sāl* [Icel *selia;* AS. *sellan*, to transfer, to sell: Icel. *sala*, delivery, bargain]: the act of selling; the exchange of any sort of goods for money or equivalent value; an auction (see SALE OF GOODS: SALE OF LAND). SALABLE, a. *sāl'a-bl*, that may be sold; that finds a ready market. SAL'ABLY, ad. *-blī*. SAL'ABLENESS, n. *-bl-nĕs*, the state of being saleable. SALEWORK, work made only for sale; work not executed with the usual care. BILL OF SALE: see under BILL 2. ON SALE, or FOR SALE, that may be bought; offered to purchasers. SALESMAN, n. *sālz'man*, one who attends to the sale of goods; a dealer in the way of selling; one who sells beasts at market; a commercial traveller. SALE'ROOM, n. *-rôm*, the room or department where sales are made; an auction-mart.

SALE, *sāl*, GEORGE: oriental scholar: b. prob. in Kent, England, near the end of the 17th c.; died 1736, less than 40 years of age. Almost nothing is known of his private life. He had his education at the King's College, Canterbury. Brought up to the law, he is believed to have practiced it almost to the end of his life. He assisted in the *Universal History*, and was one of the authors of the *General Dictionary;* but he is best known by his unrivalled translation of the Koran, 'with explanatory notes taken from the most approved commentators, to which is prefixed a preliminary discourse' (1734). This 'preliminary discourse' is of great value; it treats, among other things, 'of the Arabs before Mohammed—their history, religion, learning, and customs; of the state of Christianity, particularly of the Eastern Churches, and of Judaism, at the time of Mohammed's appearance; and of the methods and circumstances of the establishment of his religion, of the doctrines, precepts, and peculiarities of the Koran, and of the principal Mohammedan sects.' This translation formed a new epoch in the study of Islam and its literature; and it still bears the palm: see KORAN.

SALE OF GOODS: contract by which the seller, in consideration of a price, transfers the property in the goods to the purchaser. Where the consideration is not money but goods, the contract is called exchange or barter. When the bargain is struck, and the sale relates to specific goods, the property vests at once in the purchaser, so that in event of any damage or destruction of the goods, the loss is the purchaser's and not the seller's, even though the goods have not been delivered, and whether the price has been paid or not. The contract may be made either by word of mouth or by writing; but when the price exceeds a certain sum, in some states $50, in others $40, or $30, the Statute of Frauds enacts that the contract shall not be binding unless it is in writing. If, however, the buyer shall have accepted part of the goods sold, and actually received the same, or if he shall have given something in earnest to bind the bargain, or in part payment, then a verbal contract will be binding though the price exceeds the statutory sum. When a contract of sale is made, the duty of the

seller is to deliver the goods as soon as the buyer has performed all the conditions agreed upon. If no time was specified for delivery, then he must deliver the goods in a reasonable time. In general, if nothing is agreed to the contrary, the seller need not deliver till the price is paid, but he must do so if the bargain was, that delivery was to take place before payment, in other words, if the sale was on credit. On the other hand, it is the duty of the buyer to accept the goods and pay for them. If either party fail at any stage in his performance of the duties arising out of the contract, the other may bring an action which varies according to the nature of the breach of contract. One valuable right of the seller, when he has sent his goods to the buyer, and they are not delivered, is to stop them *in transitu*. Stoppage *in Transitu* (q.v.) is resorted to chiefly when the seller hears of the bankruptcy of the buyer after he has sent him goods. For the law regulating the S. of G. by agents, see AGENT: BROKER: FACTOR.

SALE OF LAND: contract for transfer of title to land; differing in several respects from sale of goods. An agreement for sale of land must, as a rule, be in writing, otherwise it cannot be enforced. When once a contract for sale of land has been entered into, a court of equity will, contrary to the general rule which prevails when a contract is broken, enforce specific performance of the contract; i.e., will compel the seller or buyer to carry out his contract, and transfer or accept conveyance of the land The seller of land does not, in general, guarantee the title should such guarantee be required, a warranty to that effect is inserted in the contract. Commonly the purchaser has an investigation made as to the condition of the title. If the title is proved defective, the purchaser is not held by the contract, and can recover from the seller damages as well as the cost of search: see DEED.

SA'LE, or SLA: see SALLEE.

SA'LEM: city, one of the caps. of Essex co., Mass.; on the Atlantic Ocean, and on the Boston and Maine railroad; 16 m. n.e. of Boston; 7 sq. m. It is on a peninsula formed by two arms of the sea known as North and South rivers, has a large and well protected harbor, and is the trading centre for 70,000 people. By the Boston and Maine railroad system it has frequent and rapid communication with Boston, Lowell, Lawrence, Bar Harbor, and all White Mountain, n., and e. points. The business centre is paved, and the streets generally are macadamized. The water supply is from Wenham Lake through two main pipes; gas and electric lights are used; and there are 40 m. of electric street railroad, connecting suburbs and all surrounding towns. The public buildings include the city-hall; old U. S custom-house (see *Introduction* to Hawthorne's *Scarlet Letter*); new custom-house; old and new court-houses; E. India Marine Hall, containing the unique museum of the E. India Marine Soc. (organized 1799) and the Peabody Acad. of Sciences, Plummer Hall, containing the Salem Athenæum (organized 1810) and the Essex In-

stitute (1848), both with large and valuable libraries; House of Correction, Almshouse, Plummer Farm School, Children's Home, Old Men's Home, Home for Aged Women, Salem Hospital, and one of the state normal schools. In 1901 there were 6,092 children of school age enrolled in the public schools, of whom 4,987 were in average daily attendance; 18 public school buildings and over 100 teachers. There are several churches, including Unitarian, Roman Catholic, Baptist, 'Orthodox' Congregational, Methodist Episcopal, Protestant Episcopal, Advent, Deaf Mute, Friends, New Jerusalem, Universalist, Bethel Seamen's, Bethel Marine and Swedish, and among burial-grounds are: Harmony Grove, Greenlawn and Roman Catholic. The city government is vested in a mayor, a board of aldermen of 7 members, and a city council of 24; the waterworks are owned and operated by the municipality. Salem is one of the most interesting places in New England, and, after Plymouth, the oldest settlement in Massachusetts. It was settled 1628; was the scene (with the present Danvers) of the famous witchcraft delusion 1692; was the seat of the assembly which resolved that the people of Massachusetts were a sovereign political power 1774; and was the scene (at North Bridge) of the successful interruption of the British expedition from Boston in search of cannon 1775. It became a city 1836. The principal industries are manufactures of cotton and leather. The city is full of attractions for the antiquarian and the historical student. Pop. (1900) 35,966; (1910) 43,697.

SA'LEM: city, capital of Salem co., N. J.; on Salem river, and on the West Jersey railroad; 3½ m. c. of the Delaware river, 34 m. s.w. of Philadelphia. It was first settled in 1641, and this first colony was succeeded by a Swedish fort; it passed into the hands of the Dutch, then to the English in 1664, and was bought by the Quakers in 1674. In 1682 Salem was made a port of entry; in 1778 it was plundered by the British. It has a daily steamboat line to Philadelphia; manufactures flour, iron foundry products, glassware, oil-cloth, hollow-ware, and canned fruit; and contains court-house, city hall, public library, collegiate institute, opera-house, churches, high school, graded schools, medical institute, national banks and newspapers. Pop. (1900) 5,811; (1910) 6,614.

SALEM: Ohio, city in Columbiana co.; on the Pennsylvania railroad; 61 m. s.e. of Cleveland. It is the largest town in the county, and the center of a rich agricultural and stock-raising region. Its manufacturing interests are numerous and varied; they include machine shops, manufactories of engines, wire nails, pumps, and stoves, galvanized iron works, furniture, church furniture, church organ factories, brick-works, and tile-works. There are two national banks with a combined capital of $300,000. The city has a public high school, established in 1865. Pop. (1900) 7,582; (1910) 8,943.

SALEM, *sā'lĕm:* city, cap. of Marion co., and of Or.; on the e. bank of Willamette river and on the Oregonian and the Oregon and California railroads; 52 m. s. of Portland, 700 m. n. of San Francisco. The river is navigable the greater part of the year, and furnishes excellent water-power. The manufacturing interests include flour and woolen mills, fruit canning establishments, tanneries, brick-kilns, tobacco, carriage and wagon factories, etc. The city is well built with wide regular streets, public parks, gas and electric lighting plants. The state capitol, built 1875–6 is a handsome structure; other state institutions are the Institute for Deaf Mutes, for the blind, for the insane, the reform school, penitentiary, and state library. There are also a Masonic library, the Willamette Univ. (Meth. Episc.); a public high school established 1892; the R. C. Academy of the Sacred Heart; the Capital Business College, and in the suburb of Chemana, an Indian Industrial Training College. Pop. (1900) 4,258; (1910) 14,098.

SA'LEM: town, cap. of Roanoke co., Va.; on Roanoke river, and on the Norfolk and Western railroad; 60 m. w. of Lynchburg, 180 m. w. of Richmond. It is in a noted tobacco and agricultural region; has several excellent chalybeate and sulphur springs, hotels for summer boarders, large town hall, churches, graded public schools, banks, orphan asylums, etc. S. has a public high school and is the seat of Roanoke College founded 1853, under the control of the Lutheran church, and is a flourishing and well-endowed institution, with well-equipped library and numerous scholarships. The town has a variety of industrial and manufacturing interests, including tobacco factories, furniture factories, carriage and wagon factories, tanneries, etc. Pop. (1890) 3,279; (1900) 3,412; (1910) 3,849.

SALEM *sā'lĕm:* town in s. India, cap. of the collectorate of S., 193 m. w. of Madras. The collectorate is the chief seat of the curious and ancient Indian *steel manufacture.* The town is in an elevated valley, 1,070 ft. above sea-level, bounded n. and s. with hills. It is well built. Cotton and silk are grown in the highly cultivated country around. Pop. 70,600.

SALEMI, *sä-lā'mē:* town of Sicily, province of Trapani, 39 m. s.w. from Palermo. Pop. about 12,000.

SALEP, n. *sä'lĕp* [Turk. salleb]: drug, used largely in the East as a nervine and fattener, and in parts of Europe as a demulcent drink—advantageous also in inflammatory conditions of the mucous membrane, as in bronchitis, diarrhea, and some urinary disorders. It consists of the tubers of many species of *Orchis* and other *Orchidœ*, dried for food. Of the two tubers usually found at the roots of these plants, only one is gathered for S., the younger and

more solid of the two. The tubers are gathered when the stalk is about to fall. They vary from the size of a cherry-stone to that of an olive. They are cleaned, dipped for a few minutes in boiling water, and dried as quickly as possible, by which process they are rendered hard and horny, and may be reduced to granular powder. The greater part of the S. of commerce is brought from the East, and much of it from Persia; it is supposed to be obtained from species of *Eulophia;* but most of the European species of *Orchis* are used for it. Before coffee became common S. was an article of considerable importance; and large quantities were imported into western countries from Turkey, Persia, and India. In France it is still in demand. For use it is ground into powder, and mixed with boiling water, sugar and milk being added according to taste. As a diet drink, it was considered very nutritious and wholesome; and half a century ago it was sold, ready prepared, to the working-classes of London, early in the morning, from numerous street stalls. Its principal constituents are *bassorine*, starch, and phosphate of lime.

SALERATUS, or SALÆRATUS, n. *săl'ē-rā'tŭs* [L. *sal*, salt, and Eng. *aerated*]: prepared mixture of bicarbonate of soda and salt, a sesquicarbonate of potash—used by bakers and housekeepers with cream of tartar and buttermilk for baking bread: see POTASSIUM: SODIUM.

SALERNO, *sâ-lĕr'nō* (anc. *Salernum*): city of s. Italy, chief town of the province of S., on the Gulf of S., 32 m. e.s.e. of Naples. A Gothic wall, of huge stones without mortar, encircles it; the streets are paved with lava, and, except the two principal ones, are narrow, irregular, and dirty. It has a strong castle, and a very small harbor. The old and beautiful Gothic cathedral was erected by the Normans, and has around it a portico of porphyry and granite pillars brought from Pæstum by Robert Guiscard. It has many famous sepulchres, among others, those of Robert and Guillaume Guiscard, of Margaret of Anjou, and of Gregory VII. S. was famous in the middle ages for its school of medicine (the *Schola Salernitana*), founded by Robert Guiscard about the end of the 11th c., long the first med. school in Europe. The univ. has fallen into decay. In its neighborhood, which produces excellent wine, are the ruins of Pæstum, destroyed by the Saracens, 9th c. Of anc. Salernum or Salurnum, there remain the Temple of Neptune, that of Ceres, and the ruins of an amphitheatre and of a theatre.—S. was founded by the Greeks; it became important under the Roman empire, then passed into possession of the Goths, and of the Lombards. Robert Guiscard made himself master of it 1076. Charles V. united it to the kingdom of Naples. Pop. (1901) 42,727.

SALERNO, GULF OF (anc. *Sinus Pæstanus*, on whose shores, in early times, the Greek city of Pæstum [q.v.] stood): nearly semicircular indentation on the w. shores of s. Italy, s.e. of the Bay of Naples, from which it is separated by the promontory ending in Point Campanella. The Gulf is 36 m. wide at its entrance, and sweeps inland for 24 m. On its shores are the towns Amalfi and Salerno

SALES, FRANCIS DE, Saint. See FRANCIS DE SALES, Saint.

SALESMAN. See under SALE.

SALEYER ISLANDS, *sâ-lī'ĕr*, THE: in the Indian Ocean s. of Celebes. More than 30 of the group are small, hilly, densely wooded, and, with few exceptions, uninhabited. Great Saleyer, 5° 44′—6° 26′ s. lat., and 120° 23′—120° 37′ e. long., is more than 40 m. long and 7 wide; 336 sq.m. The mountains on the e. coast rise abruptly out of the sea, and along the w. is a slip of level land planted with cocoa-nut trees. Pop. 60,000. Great Saleyer and the smaller islands produce fine timber, including ebony and teak. Indigo, coffee, and mustard are grown; but millet, maize, earth-fruits, and cotton are the staple cultures, the grounds being carefully fenced. Agriculture is the chief employment, and fishing, making salt, etc., are carried on. The exports are cocoa-nuts, cocoa-nut oil, cotton, and cotton fabrics. Imports—rice, gambir, tobacco, yarns, iron and copper wares. Since the Netherlands government made Macassar a free port, sea-going ships are not permitted to anchor at Saleyer; and the trade is carried on by small vessels, which sail between that island, the Bight of Boni, Sumbawa, Bali, Borneo, Java, Macassar, and Singapore. The sea is rich in various kinds of fish—a long and thin species, the Saleyer, giving a name to the island.

The Saleyer Islands are governed by 14 rajahs, superintended by a Netherlands agent. The natives are Mohammedans, each large village having a mosque and priest. The high-priest resides near the political agent, has a seat in the council, and is consulted on religious questions. Some of the rajahs and notables have tables and chairs, tea and dinner services, silver spoons and forks, mattresses, cushions, and even satin bed-curtains.

SALIAN, a. *sā'lĭ-an:* of or pertaining to the Salii or priests of Mars in ancient Rome.

SA'LIANS, or SALIC FRANKS. See SALIC LAW.

SALIC, a. *săl'ĭk*, or SALIQUE, n. *săl'ĭk* or *sāl'ēk* [F. *salique*, salic law—derived from the laws of the ancient *Salian* Franks]: applied to the law of France (see SALIC LAW). SALIAN, a. *sā'lĭ-an*, of or pertaining to a tribe of Franks who settled on the Sala, now the Yssel, from the 3d to the middle of the 4th century.

SALICACEÆ. See WILLOW.

SALICACEOUS, a. *săl-ĭ-kā'shŭs* [mod. L. *salicaceæ*]: belonging or relating to the willow or to the natural order *Salicaceæ*. SALICETUM, n. *săl-ĭ-sē'tŭm* [L. *salix*, *salicis*, a willow]: willow plantation.

SALICIN, n. *săl'ĭ-sĭn* [L. *salix* or *salīcem*, a willow]: bitter crystallizable substance extracted from the bark of the willow or the poplar. SALIGENIN, n. *săl-ĭj'ĕn-ĭn*, a derivation of salicin. SALICYLIC, a. *săl-ĭ-sĭl'ĭk* [from L.

salix, willow]: derived from the willow. The word is used only in the name of Salicylic Acid (q.v.). SAL'ICYLATES, n. salts of salicylic acid.—*Salicin* ($C_{13}H_{18}O_7$) is a member of the group of organic compounds to which the term *glycosides* has been applied by chemists—a group characterized by the fact that each of its members, when exposed to certain chemical agencies, breaks up (usually after absorption of water) into glycose (or grape-sugar) and other compounds. It occurs in the bark of the various species of willow and poplar, in the blossoms of several species of *spiræa,* and probably in the animal secretion known as *castoreum.* It may be obtained in small, colorless, glistening prisms of intensely bitter taste, which are readily soluble in hot water and in alcohol, and moderately soluble in cold water, and are insoluble in ether and oil of turpentine; and its solutions exert a left-handed rotatory action on a ray of polarized light. When heated to 248°, Salicin fuses; and at a higher temperature it is entirely decomposed. It dissolves in strong sulphuric acid, the solution being of purple or blood color. Salicin is manufactured to a considerable extent as a cheap substitute for quinia. There are various modes of extracting it from the macerated bark; and 1 lb. of the bark of *Salix pentandra* yields, according to Erdmann, 5 drachms of salicin. If it is not so certain in its action as a febrifuge as quinia, there can be no doubt that it is an excellent tonic; and it is less likely than quinia to irritate the stomach. Dr. Neligan reports that he has used it extensively as a tonic in the debility following acute diseases, particularly in cases accompanied by irritability of the digestive organs, and considers its powers fully equal to those of sulphate of quinia. As a tonic, two grains may be given three or four times a day; as a febrifuge, one to two scruples in divided doses, during the intermission. See SALICYLIC ACID.

SALICIONAL, n. *sa-lĭsh'on-al* [L. *salix,* a willow]: organ stop of soft and delicate quality, supposed to be similar to the *salicis fistula,* or withy-pipe. It is generally placed in the choir organ, but sometimes in the swell, in either case replacing the dulciana, which it greatly resembles.

SAL'IC LAW: the code known as the *Salic Law* is a collection of the popular laws of the Salic or Salian Franks (see FRANKS) committed to writing in barbarous Latin in the 5th c., while the people were yet heathen. There exist several texts of this code, and considerable obscurity rests over its history. It relates principally to the compensation and punishment for crimes; and there is a chapter containing provisions regarding the succession to what are called *Salic Lands,* which seem to have been inserted at a later date. It is difficult to determine precisely what these lands were. The *terra salica* was probably so called from its being more especially attached to the *sal* or hall of the lord or proprietor (some

derive *salic* as applied to the people from the same word); it thus came to designate inherited land as opposed to property acquired otherwise. Although the Frankish law did not in general exclude females, the succession to these salic lands, whatever they were, was confined to males, probably from the importance of securing the military service of the chief proprietors. It was but a doubtful analogy that led the rule of succession to salic lands to be extended to the succession to the French crown, and it seems to have been only in the 14th c. that the exclusion of females from the throne became an established principle. The accession of Philip the Long was probably the first occasion on which it received public sanction, and the fact that Edward III. rested his claim on female succession, doubtless led to that instance being regarded as an unquestionable precedent for all future time. See Hallam's *Europe in the Middle Ages;* Guizot, *Essais;* and the *Lex Salica with the Glosses,* by Hessels (1880).

SALICORNIA, n. *săl'ĭ-kor'nĭ-ă* [L. *sal,* salt, *salis,* of salt; *cor'nua,* horns]: a Linnæan genus of saline plants, ord. *Chen'opodĭā'cĕæ,* natives of the sea-shore, whose species yield soda in quantities.

SALICYLIC (*sal-ĭ-sĭl'ĭk*) ACID AND SOME OF ITS IMPORTANT COMPOUNDS: salicylic acid, ortho-oxy-benzoic acid. $C_6H_4.OH.COOH$ occurs in the free condition in the buds of the *Spiræa ulmaria* (meadow-sweet) and as a methyl ester in the oil of *Gaultheria procumbens* (wintergreen). It may be prepared by oxidation of saligenin, a compound obtained from salicin; also by action of carbon dioxide on dry sodium phenolate at the proper temperature. A very pure form is obtained by the action of alkalies on oil of wintergreen. Fine white needle-like crystals of a sweetish acid taste, slightly soluble in cold water, easily so in hot. Its aqueous solution is colored a violet upon the addition of a small amount of ferric chloride. It is a valuable antiseptic, the presence of even very small amounts being sufficient to prevent the decomposition of most animal and vegetable tissues or products. Used extensively in the preservation of milk, beer, cider, meats, canned goods, and other food products. The question of its action on the consumer is still open, but the weight of evidence seems to be that its continued use is injurious to the digestive organs and to the general health. It forms a number of crystalline salts of the metals, the most important being

SODIUM SALICYLATE: a white or pinkish white finely crystalline body, of a sweetish taste, soluble in water or alcohol. Often used as a preservative in place of the free acid, but the most important use is as a remedy for rheumatism, gout, etc. Dose from 10 to 30 grains.

METHYL SALICYLATE: $C_6H_4.OH.CO.OCH_3$, synthetic oil of wintergreen, forms the larger part of the oils of wintergreen and of birch, may be made by action of

methyl alcohol (wood spirit), sulphuric acid, and salicylic acid. The compounds derived from salicylic acid that are used in medicine are very numerous, some of the important ones being Salicylanid, Salol, Salophen, Betol, Salifebrin, Salipyrin, etc. They are used as antiseptics or as antirheumatics.

SALIDA: Colo.; city in Chaffee co.; on the Denver & Rio Grande railroad; 64 m. s.w. of Colorado Springs. It is the center of a mining region where iron, copper, and silver are the principal ores; marble, onyx and limestone are also quarried in the vicinity; and agricultural and stock-raising interests are of some importance. The city contains large railroad shops, and a bank with a capital of $50,000. The Rio Grande General Hospital is located here, and there is a public high school. Pop. (1910) 4,425.

SALIENT, a. *sā'lĭ-ĕnt* [L. *salĭens* or *salĭen'tem*, leaping—from *salīrĕ*, to leap]: leaping; beating; springing; projecting outward, as an angle; forcing itself on the attention; conspicuous; noticeable. SA'LIENTLY, ad. *-lĭ.* SA'LIENT, a. or SA'LIANT, a. *-ant*, in *her.*, presenting a lion or other beast in a leaping posture—differing slightly from Rampant (q.v.).

SALIENTIA, *sā-lĭ-ĕn'shĭ-a:* term applied sometimes to the order Batrachia (q.v.): see also FROG (genus): TREE-FROG: TOAD.

SALIFEROUS, a. *săl-ĭf'ĕr-ŭs* [L. *sal*, salt; *fero*, I produce]: yielding or bearing salt; an epithet applied to the New Red Sandstone system, but no longer in use, since salt has been found with strata of all ages in various parts of the world.

SALIFY, v. *săl'ĭ-fī* [L. *sal*, salt; *facĭō*, I make]: to form into a salt. SAL'IFYING, imp. SAL'IFIED, pp. *-fīd.* SAL'IFI'ABLE, a. *-fī'a-bl*, capable of combining with an acid to form a salt. *Salifiable base* is any substance thus capable. SAL'IFICA'TION, n. *-fĭ-kā'shŭn*, the act of salifying.

SALINA, *sa-lī'na:* city, capital of Saline co., Kan.; on the Atchison, Topeka & Santa Fé, the Chicago, Kansas & Nebraska, the Missouri Pacific, and the Union Pacific railroads; 118 m. w. of Topeka. It is in the center of the state, and its immediate vicinity is watered by the Smoky Hill, Salmon, and Saline rivers, the first furnishing water-power for large flour-mills on its banks, for grain elevators, for paper-mills, and for other manufacturing interests, including carriages, wagons, farming implements, and foundry products. In the neighborhood also are valuable salt springs and gypsum quarries. Salina is the trading emporium of a large agricultural and stock-raising region and exports large quantities of grain. It has banks, federal court buildings, public parks, driving park and race track, electric lighting plants, churches, high school, graded schools, and free library. It is the seat of St. John's Military School (Prot. Episc.), Kansas

Wesleyan University, Skelton's Business College, and the Kansas Wesleyan Business College. Pop. (1910) 9,688.

SALINA, *sâ-lē'nâ*, or SALINI, *sâ-lē'nē:* one of the Lipari Islands (q.v.).

SALINA FORMATION, or SALINA STAGE: in North American geology, an important group of beds, belonging to the upper part of the Siluric series, named from a township in Onondaga co., New York, where salt springs, issuing from this formation, were discovered in the 17th c. by the Jesuit missionaries. The formation, which consists mainly of shales, with frequently extensive salt and gypsum beds, comes to the surface in an east and west belt extending from Herkimer co., New York, westward across the Niagara river into Canada. Its erosion has caused a belt of low, often swampy country, averaging normally from 8 to 15 m. in width, which is followed by the Erie canal and the New York Central and other railroads. The formation extends across Canada, where its outcrop is chiefly drift-covered, into Michigan, where it comes to an end. Southward it is known in northern Ohio (500 feet thick) at a depth of 2,000 feet below the surface, but disappears in southern Ohio. Southeastward the formation is known in Pennsylvania and Maryland. The salt of the formation is distributed in irregular lenticular beds, which, with their outer stratified shale seams, often aggregate several hundred feet in thickness. The salt is largely obtained from wells by the leaching process and the solar evaporation of the brine. The chief localities where this is carried on in New York state are Syracuse and Warsaw. The beds of this formation are for the most part non-fossiliferous, and were deposited in an enclosed basin or dead sea which characterized eastern North America in late Siluric time.

SALINAN INDIANS: named from Salinas river. A linguistic family of North American Indians formerly inhabited parts of San Luis Obispo, Monterey, and San Benito counties, California, their habitat extending from the Coast Range to the Pacific and from the headwaters of the Salinas river to near the present Solidad. They subsisted by hunting and fishing, ekeing out their livelihood by means of acorns, seeds and roots. They manufactured coiled basketry, but of their general habits and customs almost nothing is known. The missions of San Antonio (1771) and San Miguel (1797) were established among them by the Spanish fathers, the baptisms during the mission period numbering 4,400 and 2,400 respectively. The population gradually decreased, however, and now the stock is represented by only a score of individuals.

SALINAS: a river in California, in Monterey co., which flows north by west into Monterey bay. It is about 150 m. long.

SALINE, a. *sā'līn* or *sā-līn'* [F. *salin*, saline—from L.

salīnum, a salt-cellar—from *sal*, salt: It. *salino*]: consisting of salt, or constituting salt; partaking of the qualities of salt: N. a salt-spring. SALINENESS, n. *să-līn'nĕs*, the state of being saline. SALINAS, n. plu. *să-lī'naz*, the name given in South America to those superficial deposits which often occupy extensive plains on the Pacific or rainless side of the Andes—usually covered with a white saline efflorescence. SALINATION, n. *săl-ĭ-nā'shŭn*, a washing or steeping in salt liquor. SAL'INIF'EROUS, a. *-nĭf'-ĕr-ŭs* [L. *fero*, I produce]: producing salt. SAL'INOM'-ETER, n. *-nŏm'ĕ-tĕr* [Gr. *metron*, a measure]: an instrument for measuring the quantity of salt that may be in solution in the water of the boiler of a marine steam-engine, indicated by the specific gravity of the water. SALINE MEDICINES, such salts as magnesia, potash, soda, and common salt. SALINE SPRINGS, springs which contain a large percentage of such salts. SALIMETER, n. *sa-lĭm'-ĕ-tĕr* [L. *sal*, salt; Eng. *meter*]: instrument for measuring the amount of salt present in a solution.

SA'LINE PLANTS: plants which require for their healthy and vigorous growth a considerable supply of *Chloride of sodium* (common salt) and other salts, and which are therefore limited to peculiar situations. Few are strictly aquatic except the marine Algæ, or sea-weeds, which grow immersed in salt water, either always or in certain states of the tide, and derive their nourishment from it through their fronds, and not by roots from the rock to which they are attached. Grasswrack (q.v.), however, is an instance of a phanerogamous plant living entirely and always immersed in salt-water. Other phanerogamous plants grow chiefly or only on the sea-shore and in salt marshes. Some of these, however, as the sea-kale, may be cultivated in gardens remote from the sea, but they thrive best when liberally supplied with salt. Asparagus is another well-known garden-plant, which derives much benefit from similar treatment. Some of the Saltworts (q.v.) and other saline plants yield much soda when collected and burned, and the produce was a former article of export from Spain and other countries under the name Barilla (q.v.). The dry steppes of Russia and Tartary, having in many places a strongly saline soil, are covered with very peculiar vegetation. Among the ornaments of these steppes is *Halimodendron argenteum*, shrub of nat. order *Leguminosæ*, often cultivated in gardens for its beautiful rose-colored flowers and silvery gray leaves. Saline plants have all their tissues impregnated with salt.

SA'LINE POWDER, COMPOUND: popular and harmless form of aperient medicine. There are several varieties prepared by druggists; the following is a specimen of a laxative usually efficacious and not unpleasant. Take half an ounce of carbonate of magnesia, and an ounce of each of the following—viz., sulphate of magnesia, bicarbonate of soda, tartrate of soda and potash, and tartaric acid.

Expel all the water of crystallization, and mix. This powder, if kept dry, effervesces when mixed with water, and one or two teaspoonfuls are the average dose.

SALINS, *sâ-lăng'* (ancient *Salinæ*): town of the department of Jura, France, 52 m. n. by w. from Geneva; on the Furieuse, a feeder of the Doubs. It is a narrow rocky gorge between two lofty hills, looking on a fertile and beautiful valley. It derives its importance, and its name, from its salt-works. The salt is obtained from brine-springs, and the evaporation of the brine is done mostly in a great building, in the valley below the town, which has long borne the name *Salines Royales;* but that of the weaker springs is conveyed in pipes 15 m. to the forest of Chaux, where it is first slowly evaporated in *maisons de graduation*, and afterward by boiling. There are iron-works, soda-factories, tanneries, and quarries of gypsum in Salins and its neighborhood. Pop. 5,500.

SALIQUE, a. *săl'ĭk* or *săl'ēk* [F.]: same as SALIC (q.v.).

SALISBURY, *sawlz'bėr-ĭ:* town in the n.w. corner of Connecticut, in Litchfield co., 63 m. n.w. of Hartford; noted for its scenery, embracing the Twin and other lakes, the Taconic Mts., and the highest land in the state, Bear Mt. Besides the village of Salisbury, there are Lakeville, Chapinville, etc., on the Central New England railroad, and Lime Rock, a manufacturing center. Ethan Allen had a forge for cannon in Salisbury during the Revolutionary war. The farming industries are important and iron-mining is actively carried on. Salisbury has a blast furnace and manufactures cutlery, and various foundry products. It has a State School for the Feeble Minded, Hotchkiss School for boys, and a memorial library. Pop. (1900) 3,489; (1910) 3,522.

SALISBURY: Md.; village, county-seat of Wicomico co.; on the Wicomico river, and on the Baltimore, C. & A. and the New York, P. & N. railroads; 84 m. s.e. of Baltimore. It is in an agricultural and lumbering region, and has a large trade, exporting chiefly grain, fruit, vegetables, and lumber. The most important manufacturing establishment is a yellow pine box factory, the largest in the United States; there are also saw and planing mills, flour mills, and a wool carding mill. There is a national bank with a capital of $50,000, and a state bank. The village has a public high school established in 1872. Pop. (1900) 4,277; (1910) 6,690.

SALISBURY: N. C.; city, county-seat of Rowan co.; on the Southern railroad; 130 m. w. of Raleigh. It was originally settled by English churchmen from Salisbury, England, and was named for that city; it was selected as the county-seat as early as 1753, but was not chartered until 1770. It is the center of an agricultural and mining region; and contains tobacco-factories, iron foundries, machine shops, railroad workshops, tanneries, and cotton

and woolen mills. There is a national bank and a state bank. The city has a public high school, established in 1899, which had in 1903 a library of over 1,200 volumes; and it is also the seat of Livingstone College, established in 1882, by the African Methodist Episcopal Church, for the education of the colored race, and the State Colored Normal School. Pop. (1900) 6,277; (1910) 7,153.

SALISBURY, *sawlz'bĕr-ī*, or NEW SARUM, *sā'rūm:* capital of Wiltshire, England; an episcopal city, and municipal and parliamentary borough, in a fertile valley on the Avon, at the junction of that river with two of its affluents, 83 m. s.w. of London by the Southwestern railway, 23 m. n.w. of Southampton by a branch of the same. Its several parts are connected by three bridges. The town dates from 1220, in which year the cathedral was founded, and the inhabitants of Old Sarum, two m. to the n., removed to Salisbury, attracted to the new site by the abundant supply of water. At the foundation of the town, the ground was divided into squares, or 'chequers,' as they are called, to which is due its appearance of airiness and regularity. The cathedral, the principal building of Salisbury, is one of the finest specimens of early English in the country. It was begun 1220, finished 1258. The spire, added afterward, is the 'most elegant in proportions and the loftiest in England.' Its height from the pavement is 400 ft.; only 60 ft. less than that in Strasburg. The cathedral is 449 ft. long; height in the interior, 81 ft.; width of great transept, 203 ft. It is in the form of a double cross, is perfect in plan and proportions, and in the main uniform in style. The west front is still rich, beautiful, and graceful, though now denuded of statues, more than 100, with which it was formerly enriched. The cathedral has been recently restored.—The manufactures of cutlery and cloth, for which Salisbury was famous, have long declined, and its trade is now chiefly retail and agriculture. Pop. 17,100.

SALIS'BURY, EDWARD ELBRIDGE, LL.D.: philologist: b. Boston, 1814, Apr. 6; d. 1901, Feb. 5. He graduated from Yale College 1832, from the Yale Theological Seminary 1835, went abroad for the study of oriental languages; and 1841 became professor of Arabic and Sanskrit at Yale. He endowed the chair of Sanskrit, and 1854 was succeeded by Prof. Whitney, but remained professor of Arabic till 1856. He was prominent in founding the American Oriental Society, was for many years editor of its journal, and was a member of various learned bodies.

SALIS'BURY, ROBERT ARTHUR TALBOT GASCOIGNE CECIL, Marquis of, K.G.: statesman: b. Hatfield, Herts, Eng., 1830; d. 1903, July 22. He was educated at Eton School, and at Christ Church, Oxford. He was M. P. for Stamford 1853-1865, June 14, when at his father's death he succeeded to the peerage. In the meantime he was styled, at first, Lord Robert Cecil, and then on the death

of his elder brother, he assumed the title Viscount Cranborne. He was secretary of state for India 1866, July—1867, Mar. He was elected chancellor of the University of Oxford 1869. Again he became secretary of state for India 1874, Feb. He was special ambassador to the Sublime Porte 1876-7, and was a member of the conference at Constantinople of representatives of European powers with the sultan's ministers. On his return home, Salisbury was appointed secretary of state for foreign affairs 1878, Apr. 2, and soon afterward went with Lord Beaconsfield to Berlin as representatives of England in the congress there held. He went out of office with Beaconsfield's government 1880, Apr. After the death of Beaconsfield, Salisbury became leader of the conservative party in the house of lords. He became premier 1885, June 9. In the general election 1885 the liberals won, and Salisbury went out of office; but again he became prime minister 1886. In 1892 his ministry fell on the question of Home Rule for Ireland, but with the defeat of that measure in Parliament Salisbury again became prime minister, 1895, July 26. Before he succeeded to the marquisate, Salisbury was a frequent contributor to the *Quarterly Review*, the *Saturday Review*, and other periodicals. Lord Salisbury's leadership added strength to the conservative party; its most notable qualities were its sagacity and foresight, its fertility in expedients, and a certain audacity in claiming and holding a position for the party. In 1902 he resigned, and was succeeded by Arthur James Balfour.

SALIS'BURY PLAIN: extensive tract of undulating chalk country, in Wiltshire, England, between Salisbury and Devizes; about 20 m. long from n. to s., and about 14 m. broad. Its rolling surface resembles that of the ocean heaving after a storm. On this plain, about 8 m. n. of Salisbury, is Stonehenge. Until within recent years, the expanse of Salisbury Plain remained in a state of nature, and was covered with a fine turf, which afforded pasture to sheep. The natural features of the plain, however, are now much changed. North and south of Stonehenge, wild slopes of thistle-covered turf still extend; but both e. and w. of it the country is laid out in cultivated fields; and within gun-shot of the desolate old relic is a neat modern farm-house.

SALISH, *săl'ĭsh*, or SELISH, *sĕl'ĭsh:* one of the Indian families of the Columbian group, located in the n.w. part of the United States. It is made up of the following tribes: the Colvilles and the Pisquouses on the Columbia river; three groups of the Kalispels; the Skitsuish, on a lake of the same name; the Spokanes, on the Spokane river; and the Flatheads. Some of these tribes have embraced the Roman Catholic faith. They closely resemble various tribes of the Shushwap group.

SALIVA, n. *să-lī'va* [L. *salīvă*, spittle: It. *saliva;* F. *salive*]: the digestive fluid which gathers in the mouth,

being secreted by the salivary glands (q.v.). It converts starch into sugar and its action constitutes the first part of the process of digestion (q.v.). When discharged from the mouth, mixed with mucus, it is called *spittle.* SALI'-VAL, a. *-val,* or SALIVARY, a. *săl'ĭ-vĕr-ĭ,* pertaining to saliva; secreting or conveying saliva, as glands. SAL'-IVATE, v. *-vāt,* to produce an unusual secretion and flow of saliva—usually by administering mercury. SAL'IVAT-ING, imp. SAL'IVATED, pp. SAL'IVANT, a. *-vant,* producing salivation: N. that which produces salivation. SAL'IVA'-TION, n. *-vā'shŭn* [F.—L.]: act or process of producing an excessive flow of saliva—usually by mercury (see below). SALIVOUS, a. *sa-lī'vŭs,* pertaining to saliva, or resembling it.

S'ALIVAHANA, *sâ-lė-vâ'ha-na:* Hindu prince, said to have reigned in Magadha or South Behar. He instituted an era which bears his name, and which began when 3,179 years of the Kali-yuga, or the present mundane age, had expired; i.e., 78 years after the beginning of the Christian era. This era is called S'âliyâhana S'âka, or simply S'âka. The S'âka year is the same as, and begins with, the common solar year.

SAL'IVARY GLANDS: glands secreting or conveying saliva. Under this name are designated three pairs of glands—the parotid, the submaxillary, and the sublingual, each gland having an efferent duct, which conveys the glandular secretions into the mouth, where, when mixed with the mucus secreted by the follicles of the mucous membrane lining the mouth, they constitute the ordinary or mixed saliva.

The *Parotid Gland* [named from Gr. *para,* near, and *ous,* the ear] is the largest of the three glands occurring on either side. It lies on the side of the face immediately in front of the external ear, and weighs from half an ounce to an ounce. Its duct is about two inches and a half long, and opens into the mouth by a small orifice opposite the second molar tooth of the upper jaw. The walls of the duct are dense and somewhat thick, and the caliber is about that of a crowquill.

The *Submaxillary Gland* is, as its name implies, below the jawbone (part of which is cut away in the figure), and is placed at nearly equal distances from the parotid and sublingual glands. Its duct is about two inches in length, and opens by a narrow orifice on the top of a papilla, at the side of the *frænum* of the tongue.

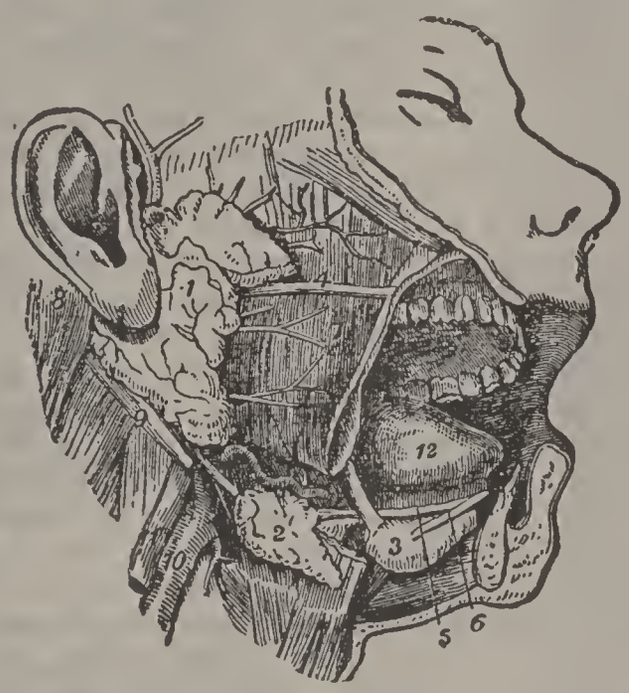
The *Sublingual Gland* is, as its name implies, under the tongue, each gland lying on either side of the *frænum.* It has a number of excretory ducts which open separately into the mouth.

For the minute structure of the parotid gland, see GLAND: the other salivary glands are similarly constituted. True salivary glands exist in all mammals, except the cetacea, in birds, and reptiles (including amphibians), but not in fishes; and glands discharging a

similar function occur in insects, many mollusks, etc. For the chemical and physical characters of the saliva, see DIGESTION.

The most common disease of the parotid gland is a specific inflammation (see MUMPS). The term *Parotid Tumors* is given to tumors of various kinds occurring in front of the ear and over the parotid gland.

Certain functional disorders of the salivary glands require notice, of which the most important is that known



The Salivary Glands.

1, the parotid gland; 2, the submaxillary gland; 3, the sublingual gland; 4, Steno's duct; 5, Wharton's duct; 6, Bartholin's duct; 7, masseter muscle; 8, mastoid process; 9, digastric muscle; 10, internal jugular vein; 11, external carotid artery; 12, the tongue.

as *Salivation*, or *Ptyalism*, which consists in a much increased secretion of saliva. *Deficient Secretion* is indicated by clamminess or dryness of the mouth, and is common in low forms of fever: it is important as indicating the condition of the system, and seldom requires treatment. If it should occur as an original affection, it must be treated by local Sialogogues, such as licorice, horse-radish, pellitory, etc. *Alteration of the Saliva* often occurs in disease; e.g., it sometimes loses its alkaline character, and becomes acid, as in acute rheumatism, diabetes, etc.; while in other cases, it becomes so fetid as to be a source of annoyance both to the patient and his friends; e.g., in scurvy, various forms of dyspepsia, salivation, etc. The undue acidity may be corrected by administration of carbonate or bicarbonate of soda, while the fetor may be relieved by attention to diet, and by use, both local and general, of creosote, nitro-muriatic acid, charcoal, chlorate of potash, etc.

Ordinary Inflammation of these glands (distinct from

mumps) may proceed from cold or local injury, but is produced often by decayed teeth.

SALIVA'TION, or PTYALISM, *tī'a-lĭzm:* abnormally abundant flow of saliva. It arises most frequently from a specific form of inflammation of the parotid glands, induced by the action of mercury, in which case it is termed mercurial salivation; but it arises occasionally from the action of other drugs, especially iodide of potassium; and sometimes it occurs without any apparent cause, in which case it is said to be *idiopathic* or spontaneous.

Mercury, in some form or other, is so common an ingredient in quack medicines that a popular knowledge of the most remarkable manifestations of this powerful mineral should be widely diffused. When this medicine is given in such a way as to excite salivation, a metallic taste in the mouth is soon recognized by the patient, and a remarkable but indescribable smell, known as the mercurial fetor, may be detected in his breath; the gums become swollen and spongy at their edges, and usually present a few slight ulcers; and an increased flow of saliva takes place, accompanied by pain in the teeth on pressure. If these symptoms be not checked (and *a fortiori* if more mercury be given), the tongue, cheeks, and throat swell and ulcerate, and the saliva that flows away amounts to several pints in the course of the day. This peculiar action of mercury varies extremely in different persons. It is worthy of notice that salivation is rarely produced in children before the age of 10 years. To check this excessive salivation the frequent use of a gargle of chlorate of potassium is recommended. A gargle of one part of brandy to four or five of water is useful, as is also the application of moistened tannin to the gums.

SA'LIX: one of the two genera of the family *Salicineæ* (the other being *Populus*). The species inhabit the northern hemisphere and the temperate and arctic zones. See WILLOW.

SALLE, LA. See LA SALLE.

SALLEE, *sâl'lā,* or SLA, *slâ:* seaport town of Morocco, in the territory and former kingdom of Fez, 106 m. w. from Fez. It stands on a low sandy point of the shore of the Atlantic, at the mouth of the Bu-Regreb, on the n. side of the river, and opposite, on the s. side, is the town of Rabat. Both Sallee and Rabat were bombarded and nearly destroyed by the French 1851. Sallee was in former centuries noted as a haunt of pirates, and a *Sallee Rover* was the dread of peaceful mariners in the Atlantic and Mediterranean. It is noted for the carpets which it produces, of fine texture and bright colors: they are used mostly in Morocco. The chief export from Sallee is wool. Pop. estimated about 12,000, of whom 3,000 are Jews.

SALLET, n. *săl'lĕt* [OF. *salade;* It. *celata,* a helmet—from L. *eælārĕ,* to ornament]: in *OE.,* a headpiece; a helmet.

SALLIANCE, n. *săl'lĭ-ans* [see SALLY]: in *OE.,* the act of issuing forth; a sally.

SALLIE, or SAULLIE, n. *sawl'ĭ* [corrupted from *salvĕ* in *salvĕ Regīna!* hail, Queen of Heaven!]: formerly in *Scot.,* a hired mourner at the better class of funerals; two or more of these *sallies* preceded the corpse carrying long black staves surmounted by large cylindrical black hoods; in earlier times they chanted prayers.

SALLOW, a. *săl'lō* [AS. *salu,* sallow: Bav. *sal,* discolored: Dut. *zaluw,* tawny: F. *salir,* to dirty: Gael. *salaieh,* to sully]: of a pale, sickly color, tinged with dark yellow. SAL'LOWNESS, n. *-nĕs,* paleness, tinged with a dark yellow.

SALLOW, n. *săl'lō* [AS. *sealh;* Gael. *seileach;* L. *salix,* a willow]: popular name of a number of species of Willow (q.v.), trees or low shrubs with downy branches, and generally ovate or obovate, wrinkled leaves having stipules. The GRAY SALLOW (*Salix cinerea*) is one of the common species, growing in moist and swampy places. Other European common species are the ROUND-EARED SALLOW (*S. aurita*); and the GREAT ROUND-LEAVED SALLOW (*S. caprea*), the latter remarkable for preferring a dry soil, and becoming a small tree, whose wood is used for handles of agricultural implements, and furnishes charcoal used for gunpowder. The LONG-LEAVED SALLOW (*S. acuminata*) differs from the other kinds in its lanceolate leaves. None of the sallows produce such long and slender twigs as the osiers, nor are they adapted for any but the coarsest wicker-work, and some are so apt to break that they cannot easily be used in that way. But shoots of two years' growth are split up, and used for making hoops of barrels. For American species, see WILLOW.

SAL'LOW-THORN (*Hippophaë*): genus of plants of nat. order *Elæagnaceæ,* consisting of large shrubs or trees with gray silky foliage, and entire leaves. They have diœcious flowers: the perianth is tubular, becomes succulent, incloses an achenium, and forms an acid fruit. Few species are known: one only is European, *H. rhamnoides,* sometimes called the SEA BUCKTHORN, large shrub or low tree, native of the sandy sea-coasts of England and the continent of Europe, found also throughout great part of Tartary. It is sometimes planted to form hedges near the sea, growing luxuriantly where few shrubs will thrive. The berries are orange-colored. They are gratefully acid, and are used for making a sauce in s. France: a rob or jam is made of them on the shores of the Gulf of Bothnia, to impart flavor to fresh fish; and a preserve or jelly from them is a luxury of the Tartars. The *stellate* hairs of the underside of the leaf, covering it like scales, are a beautiful microscopic object.

SALLUST, *săl'lŭst* (CAIUS SALLUSTIUS CRISPUS): Roman historian: B.C. 86–34; b. Amiternum, in the Sabine country. Though of plebeian family, he rose to official distinction, first as quæstor about 59, afterward as tribune of the people 52, when he joined the popular party against Milo, who in that year had killed Clodius. His reputation for morality was never high; and his illicit connection with Milo's wife is assigned as the cause of his being expelled in 50 from the senate, though his attachment to Cæsar's party is a more plausible reason of his expulsion. In the civil war, he joined the camp of Cæsar; and in 47, when Cæsar's fortune was in the ascendant, he was made pretor-elect, and restored to his former rank. In 46, we find him engaged in Cæsar's African campaign, at the close of which he was left as gov. of Numidia. His administration was sullied by various acts of oppression, particularly, as some have charged, by his enriching himself at the expense of the people. He was, for these offenses, accused before Cæsar, but seems to have escaped trial. His immense fortune, so accumulated, enabled him to lay out those magnificent grounds, still known as the gardens of Sallust, on the Quirinal, to retire from the prevailing civil commotion into private life, and to give his remaining years to those historical works on which his reputation rests. His histories, which seem to have been begun only after his return from Numidia, are: 1st, The *Catilina*, or *Bellum Catilinarum*, descriptive of Catiline's conspiracy in 63, during the consulship of Cicero; 2d, The *Jugurtha* or *Bellum Jugurthinum*, commemorating the five years' war between the Romans and Jugurtha, King of Numidia. These, the only genuine works of S. which have reached us entire, are of great but unequal merit. The quasi-philosophical reflections which are prefixed to them are tiresome, and of no value; but the histories themselves are powerful and animated, and contain effective speeches of his own composition, which he puts into the mouths of his chief characters. With its literary excellence, however, the value of the *Jugurtha* stops, as in military, geographical, and even chronological details, it is very inexact. His now lost work, *Historiarum Libri Quinque*, is believed to have described the events between Sulla's death, B.C. 78, and the year of Cicero's pretorship, 66. The *Duæ Epistolæ de Republica Ordinanda*, and the *Declamatio in Ciceronem*, are of doubtful authenticity.

Apart from his literary qualities, which are rather those of an artifical than a natural writer, and which are not enhanced by his affectation of brevity, and his love of archaic expressions, S. has the merit of having been the first Roman who wrote what we now understand by 'history.' In official public life, he was more of a politician than a statesman; and the views which he supported were liberal, not so much because he loved the people, as because he hated the nobility. The best editions of his literary remains are those of Corte (Leip. 1724), Gerlach (Basel 1823–31), Kritz (1828–34), Fabri (1831), Dietsch (1842), Merivale (1852), Long (1860), and Capes (1884).

SALLY, n. *săl'lĭ* [F. *saillie*, a breaking out upon, a gush; *saillir*, to gush out—from L. *salīrĕ*, to spring]: a sudden rush of troops from a besieged place to attack the besiegers; an excursion; sprightly exertion; wild gayety; a flight of fancy or intellect: V. to rush out, as troops from a besieged town; to issue suddenly. SAL'LYING, imp. SAL'LIED, pp. *-lĭd*. SALLY-PORT, n. in *fort.*, the postern-gate leading from under the rampart into the ditch, through which the garrison could make sallies; but its more modern application is to a cutting through the glacis, by which a sally may be made from the covert-way: when not in use, sally-ports are closed by massive gates of timber and iron.—SYN. of 'sally, n.': eruption; sortie; egress; range; excursion; flight; escape; levity; frolic.

Sally-port.

SALLY LUNN, n. *săl'lĭ lŭn:* tea-cake, so called from Sally Lunn, pastry-cook of Bath, England, near the end of the 18th century.

SALMAGUNDI, n. *săl'ma-gŭn'dĭ* [F. *salmigondis:* origin doubtful, but comp. L. *salgāma*, pickles preserved in brine —from *sal*, salt]: a mixture of various ingredients with seasoning; an olio or medley.

SALMASIUS, *săl-mā'shĭ-ŭs*, CLAUDIUS (Latinized form of CLAUDE DE SAUMAISE): 1588, Apr. 15—1653, Sep. 3; b. Semur in Burgundy: famed French scholar. His father, a man of superior erudition, was his first teacher. At the age of ten young S. translated Pindar, and composed Greek and Latin verses. He studied philosophy at Paris, under Casaubon; and at Heidelberg, studied jurisprudence, and publicly professed Protestantism, the religion of his mother. So insatiable at this time was his thirst for book-knowledge, that he was wont to devote two whole nights out of three to hard reading, by which he brought himself near the grave. In 1608 he published from MSS. two treatises of the sectary Nilus, Abp. of Thessalonica, and a work of the monk Barlaam on the primacy of the pope. In 1629 appeared his chief work, *Plinianæ Execitationes in Caii Julii Solimi Polyhistora* (2 vols. Par. 1629); after which, he set himself vigorously, and without a master, to acquire a knowledge of Hebrew, Arabic, Coptic, and other oriental tongues. In 1631 he was called to Leyden, to occupy the chair that Joseph Scaliger had held; and from this period his European reputation dates. Various efforts were made (1635–40 to induce S. to return to France, but he declined them on the ground that his spirit was too 'liberal' for his native land. Queen Christina of Sweden, however, managed to bring him to Stockholm, and fix him there for a year (1650–1), after which he returned to Holland. He died of a fever caught by imprudently drinking the waters at Spa.—S. was certainly a fine verbal critic and commentator of the old-fashioned clumsy sort; but neither his wit

nor his acumen were adequate to give an intellectual and critical value to his lucubrations for modern use; and though all his distinguished contemporaries, Casaubon, Gronovius, Grotius, Vossius, etc., deluged him with praise; though Balzac pronounced him *infallible;* though the curators of the Univ. of Leyden declared that 'their university could no more do without Salmasius than the world without the sun;' though Queen Christina—delighted with his *Defensio Regia* until she had seen Milton's reply to it two years later—went the length of saying, with truly royal flattery, 'that she could not live without him;' yet he is remembered, not for his stores of erudition, his editions of the classics, or his treatises on classical antiquities, but for his controversy with John Milton, probably his equal in scholarship and immeasurably his superior in power of brain, and in all the arts of literary warfare. The question at issue was the lawfulness of the execution of Charles I. The great poet utterly overwhelmed S., partly by the magnificence of his language and sentiments, and partly by the intense moral enthusiasm for his subject, which gave fury to his invective. S. also had been grossly abusive and acrimonious in his treatise which called forth Milton's crushing reply (*Defensio Regia pro Carolo I.*, 1649); *asinus* (ass), *pecus* (beast), and such expressions being showered about quite freely; but his work is deficient in logic, in real force of sarcasm, and intellectual vigor generally. He had previously written against the Independents and in favor of Presbyterianism or of a modified Episcopacy.—S. in his private character was altogether estimable.

SALMI, or SALMIS, n. *săl'mē* [F. *salmis*, a hash]: a superior kind of ragout of game or wild fowl that have been half-cooked for the purpose.

SAL-MIRABILE, n. *săl'mĭ-răb'ĭ-lē* [L. wonderfull salt]: see under SAL.

SALMON, n. *săm'ŭn* [L. *salmo* or *salmōnem*, a salmon: It. *salmone* : F. *saumon*] : a sea-fish, having reddish flesh, which ascends rivers to deposit its spawn. SALM'ONET, n. *-ŭn-ĕt*, or SAMLET, n. *săm'lĕt*, a young or little salmon. SALMONOID, a. *săl'mŏn-oyd* [Gr. *eidos*, appearance] : similar to a fish of the salmon family. SALMONIDÆ, n. plu. *săl-mŏn'ĭ-dē*, the salmon family, including the salmon and the trout tribes (see below). SALMON-FRY, the salmon when recently hatched from the spawn : SALMON-PEEL, a young salmon. SALMON-TROUT, a sea trout, a migrating fish, next in value to the salmon.—*Salmon* (*Salmo*), is a genus of fishes of family *Salmonidæ* (q.v.), which as characterized by Cuvier, has teeth on the vomer, both palatine bones, and all the maxillary bones. A popular division, having regard to characters really conspicuous and important, and to the habits of the species, is the simple one of Pennell (*The Angler Naturalist*, 1863) : '1, The Silver, or Migratory species (i.e., those migrating to and from the sea) ; 2. The Yellow, or Non-migratory species ; 3. The Charrs, or Orange and Red-colored species.' The present article treats especially of the first of these groups : for the second, see TROUT : for the third, see CHARR.

By far the most important of the three *Salmonidæ* which ascend rivers from the sea is the SALMON (*Salmo salar*), in commercial importance superior to any other fresh-water fish, both from its abundance and from its delicious flavor. From ancient times it has furnished important supplies of food. Even rivers in Iceland now yield a rent, and are regularly netted for the supply of the British market, to which the S. are brought, as from other n. regions, fresh, in ice. Many rivers and streams of Norway and Canada are now frequented by British anglers, as affording sport deemed incomparable.

The S. is one of the largest species of the genus, having been known to attain the weight of 83 lbs. Very large S., however, are rare, owing to the eagerness with which the fishery is prosecuted. No fish is more symmetrical or beautiful than the S. ; and its form is admirably adapted to rapid motion even against powerful currents, by the regular tapering from the front of the first dorsal fin both to the snout and to the tail. The under

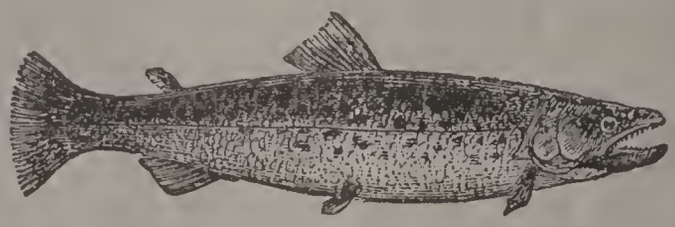
Salmon (*Salmo salar*).

jaw of the male becomes hooked during the breeding season with a kind of cartilaginous excrescence, which is used as a weapon in the combats then frequent, wounds so severe being inflicted with it that death sometimes

ensues. The lateral line is nearly straight. The scales are small, and the color a rich bluish or greenish-gray above, changing to silvery-white beneath, sprinkled above

Salmon Trout (*Salmo trutta*).

the lateral line with rather large black spots. The opercular bones show a rounded outline at the hinder edge of the gill-covers, which at once distinguishes this species from the other European species, the Salmon Trout and the Gray or Bull Trout. The tail is forked in the young



Gray or Bull Trout (*Salmo eriox*).

S., becomes nearly square in the adult. The array of teeth indicates voracity, and the S. seems to prey readily on almost any animal which it is capable of capturing. Small fishes seem to constitute part of its food; and in fresh water, the minnow, trout-fry, or the fry of its own species, worms, flies, etc. The angler catches S. with the artificial fly, or with the minnow, or the worm; and no bait is more deadly than the roe of the S. itself, the use of which is indeed prohibited in British statutes for protection of the S. fisheries.

The S. is found on all n. parts of the Atlantic, and into the rivers which fall into that ocean, as far s. at least as the Loire on the European side, and the Hudson on the American. Slight differences can be noticed between the Amer. and the European S., but not sufficient to distinguish them as species. The S. frequenting one river are often characteristically different from those of another river of the same vicinity. The S. is not found in the Mediterranean nor in the Black Sea, nor in any rivers falling into them. S. is in perfection for the table only when recently taken from the water; while the fatty 'curd' remains between the flakes of its flesh, which, however, begins to disappear within 12 hours, though otherwise the fish is quite fresh. Hence the peculiarly high value formerly ascribed in London to *Thames salmon*.

The S., after its first migration to the sea, passes a great part of its life in it, though under the necessity of periodically ascending rivers, in which the S. that ascend

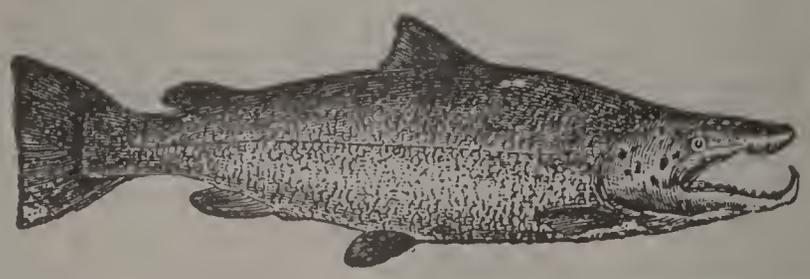
to spawn sometimes remain during most of the winter. Salmon return, in preference, to the same rivers in which they have passed the earliest part of their existence; as appears both from records of marked salmon, and from the characteristic differences alluded to. Salmon ascend rivers to a great distance from the sea, as the Rhine to the Falls of Schaffhausen, and the Elbe to Bohemia. The speed with which they glide through the water in their most rapid movements is very great; it is said to be not less than 1,500 ft. in a minute, or at the rate of 400 m. a day; but this, of course, is sustained for only a few moments, and the ordinary rate of progress in ascending rivers is supposed to be 10 to 25 m. a day. The perpendicular height which the salmon can pass over by leaping

Salmon-ladder.

when there is abundance of water in the river and sufficient depth in the pool below the fall, seems to be not more than 12 or 14 ft.; they attempt higher leaps, but often fall back exhausted, or fall on adjacent rocks. They do, however, rush up steep and broken cataracts of much greater height. The ascent of many rivers by salmon has been stopped by high weirs, dams, and other obstructions; but very simple and effectual means have been devised to reconcile the interests of manufacturers and fishery proprietors by *fish-stairs* or *fish-ladders*, which are often very conveniently formed by partitioning off a portion of the fall, and intersecting it from alternate sides, two-thirds of its width, by transverse steps of wood or stone, so as to divide it into a succession of falls.

As the time of spawning approaches, salmon undergo considerable changes of color, besides the change of form above noticed in the snout of the male. The former brilliancy of the hues gives place to a general duskiness

approaching blackness in the females, much tinged with red in the males; and the cheeks of the males become marked with orange stripes. S. in this state are 'foul



Old Male Fish, or Kipper, during the Spawning-season.

fish,' being considered unfit for the table, and the killing of them is prohibited by British laws, notwithstanding which, however, multitudes are killed by poachers in some of the rivers, nor do those who eat them either fresh or 'kippered' (i.e., dried) seem to suffer from any unwholesomeness. They are called '*foul fish*,' or more distinctively, '*spent fish*,' or *Kelts;* the males are also in Britain

Salmon Ova, and Newly Hatched Fish.

1, egg of salmon, natural size, just taken from the parent fish; 2, the same, with the eyes of the young fish just becoming apparent; this takes place about the thirtieth or thirty-fifth day, according to the temperature: 3, the young fish coiled up in the egg, and just ready to be hatched; 4, the young fish emerging from the shell; 5, the empty egg-shell, showing longitudinal rent made by the young fish; 6, young salmon about two days old, natural size; 7, the young salmon (about two days old), magnified; the umbilical vesicle, containing the yelk and the oil globules, and blood vessels ramified on its surface; also the head, with the huge eyes and badly-developed mouth (a portrait); the fins and the thin transparent body, the fins not as yet being developed into their proper shape, are carefully delineated.

called *Kippers*, *kip* being a name for the cartilaginous hook of the under jaw, and the females *Shedders* or *Baggits*.

S. spawn on beds of fine gravel, in shallow parts of

rivers, such as are used for the same purpose by trout. The spawning female approaches the bed, attended by at least one male fish, sometimes by more than one, in which case fierce combats ensue; she makes a furrow in the gravel with her tail, and deposits her spawn in it, on which the male afterward pours the vivifying molt. The eggs, when deposited and vivified, are covered by the action of the tail of the female; the male doing nothing but depositing his milt, and fighting with any other of his sex that may dispute his place.

After spawning, the S. generally soon descends to the sea. The descending *kelts* are very ravenous, and therefore a great annoyance to anglers who desire to take none but *clean* fish, and must return the kelts to the water.

In 30 to 60 days after deposit of the eggs in the spawning bed, they show signs of life, and the eyes appear as small specks. The time which elapses before the egg is hatched varies according to the temperature of the water. A temperature above 70° F. is fatal to them. The length, at first, is about five-eighths of an inch. About the seventh or eighth week, the

Gill-covers of Salmon (1), and Salmon Trout (2).

young S. has changed into a well-formed little fish about an inch long, with forked tail, the color light brown, with nine or ten transverse dusky bars, more or less distinctly visible in the young also of other species of this genus, just as the young of many feline animals exhibit stripes or spots which disappear in their mature state. The fry, previously very inactive, now begin to swim about, and seek food with great activity, and are known as PARR or SAMLET. The Parr was formerly supposed to be a distinct species (*S. salmulus*). To prove this, it was urged that the male parr is very often found with the milt perfect, to which, however, it was replied that the female parr is almost never found with perfect roe. But the remarkable fact has now been abundantly proved, that the male parr is capable of impregnating the roe of the female S., and thus a provision seems made in nature to prevent an otherwise possible loss of roe.

Gill-covers of Bull Trout.

The parr attains a size of 3½ to 8 inches. When the time of its migration comes, usually, in Europe, in May or June, it assumes brilliant silvery hues, the fins also becoming darker, and is then known as a *Smolt.* Groups of smolts, 40 to 70 in a group, now descend, not very rapidly, to the sea. They remain for a short time in brackish water, and then depart from the estuary. Of their life in the sea nothing is known, except that they increase in size with wonderful rapidity; for it has been found that smolts which had been marked returned to the same river in six or eight weeks as *Grilse* of 3 to 5 lbs., or, after a longer period, even of 8 or 9 lbs. Some reascend the rivers when of only a lb. and a half or 2 lbs. weight, and these are in some places known as *Salmon-peel.* Grilse are captured in great numbers in the latter part of summer and in autumn, but very few are seen in the earlier part of the fishing season. The grilse usually spawns on its first return to the fresh water—often remaining there for the winter, and on again descending to the sea assumes the perfect characters of the mature salmon. Little increase of size ever takes place in fresh water; but the growth of the S. in the sea is marvellously rapid, not only on its first migration, but afterward.

The S. fisheries of many of the rivers have much decreased in productiveness during the 19th c. The stake net is the most deadly of all means employed for taking S.; and in Britain its use is prohibited in estuaries and on some other parts of the coast. It consists of two rows of net-covered stakes so placed between high and low water marks that S. coming up to them, and proceeding along them, are conducted through a narrow opening into what is called the *court* of the net, from which they cannot find the way of escape. The *cruive,* now illegal in all parts of Britain, is an inclosed space formed in the wall of a dam or weir, into which the S. enter as they ascend the stream, while a peculiar grating prevents their return. The nets for catching S. in rivers and estuaries are of many different kinds. In many places a small boat, or *salmon coble,* is used to carry out a seine net from the shore, setting (*shooting*) it with a circular sweep, the concavity of which is toward the stream or tide, and men stationed on shore pull ropes so as to bring it in by both ends at once with whatever it may have inclosed. Coracles (small boats of basket-work or a light wooden frame covered with canvas and tar, or other waterproof materal) are used in S. fishing in the Severn and other Welsh rivers. Nets which a single man can carry and work are also used in many rivers and estuaries, as those called *halves* on the Solway, which may be described as a bag attached to a pole. Dogs have sometimes been trained to drive S. into nets, and some dogs have attained great expertness in catching S. without any assistance.

North American Salmon.—As late as 1873, Dr.

SALMON.

Suckley's *Monograph of the Genus Salmo* enumerated 43 species of the S. tribe in N. America, including trout. Recent investigations of the U. S. Fish Commission have reduced the number to 18, as studied by Profs. Gill and Jordan. The old genus has been divided into groups. 'The first, for which the name Salmo is retained, includes the Atlantic S. and the black-spotted species of the west; the Rainbow Trout of the Pacific slope (*S. irideus*); the Rio Grande Trout (*S. spilurus*), with two closely-related forms, more widely distributed through the Rocky Mt. region; also, the Steel-head of the Columbia (*S. Gairdneri*); and the common Black-spotted Trout (*S. Clarkii*) of the upper Missouri, Utah, the Columbia river, and other localities.' The second group includes the Charrs, or Red-spotted Trout, and the gray-spotted Salmon Trout or Lake Trout, all referred to the genus *Salvelinus*. That which is called simply the S. (*S. salar*) occurs in the n. Atlantic and its bays, gulfs, and rivers, in both America and Europe—in this country ascending as far as Niagara, and ranging along the coast and its rivers down to latitude 41°. Formerly abundant in the Connecticut river, the S. was nearly exterminated about the beginning of the 19th c. by the erection of dams, which prevented the fish from reaching their spawning grounds. They descend to the sea for more abundant food; but in the lakes they find enough, and there have varied slightly in coloration, and are designated as a variety, *S. salar sebago*, popularly known in different regions as Land-locked or Fresh-water S., with such local names in Canada as Winninish, Grayling, Schoodic or Sebago Trout, Dwarf S., etc. According to latitude and warmth of season, S. ascend our rivers from April to July; but some are resident through the winter. At the spawning season, Oct. to Dec., their handsome form and colors disappear, the skin becoming slimy and blotched with color, and the male jaw curving into a large hook used in fighting rivals; in this stage, returning to the sea, they are known as Kelts. The great run up-stream of young S., called Grilse, is not observed in the United States, where they do not appear until adult. The common adult size is 30 in., weight 10 lbs., but at Gaspé one is reported nearly 4 ft. long, weighing 47 lbs. In the great lakes, the refuse of factories, as well as the river-dams, have spoiled the S. fishery.

Salmon on the Pacific Coast.—Of the S. of the Pacific, the Steel-head (*S. Gairdneri*), 16–22 lbs., is known also as Hard-head, Salmon Trout, and by Indians of the upper Columbia as Humaana. It ranges from Kamtchatka to Monterey, always close to the coast, and is abundant in the spring in the Fraser and Columbia rivers, but not found e. of the Cascade Mts. It is in poor condition in the spring, when ascending, and little use is made of it.—The Rainbow Trout (*S. irideus*) 3–5 lbs., of the Cal. mountain streams, and as far s. on the coast as the San Luis Rey river, known as

Brook, Mountain, Speckled, or Golden Trout, is not much marketed, but is a good table-fish, and has been introduced into many eastern waters.—The Black-spotted Trout (*S. purpuratus*) attaining 2–3 ft. and 30 lbs., is known by many names, e.g., Spotted, Black, or Silver Trout, and abounds in almost every stream and lake of the Rocky Mt. region. In deep shady lakes, it is almost black; in other situations pale, while in the sea it is silvery and but faintly spotted.—The Rio Grande Trout (*S. spilurus*) is very large, and the best food-fish in N. Mex. and w. Colo.—The Dog S. (*Oncorhyncus keta*), 10–12 lbs., is found from Sacramento to Behring Strait, where it is also very abundant.—The Hump-backed S. (*O. gorbuscha*), 4–10 lbs., Sacramento to Alaska, is inferior, though canned on Puget Sound.—The Silver S. (*O. kisutch*), called also White S., 7–20 lbs., has similar range.—The Blue-back S. (*O. nerka*) called Red-fish, 8–15 lbs., from the Columbia river n., is much used for canning, but is not so excellent as the Quinnat or California S. (*O. chouicha*) 16–90 lbs., called also the Columbia or Chinnook, or King S., ranging from Monterey to Alaska and Asia. It is the great fish for canning, and, 1878–84, 200,000,000 lbs. were harvested on the Columbia river, without any apparent decrease of numbers. It resembles the *S. salar* of the Atlantic in quality, likewise in color, except that it has star-like spots of black on its back and sides. These fish are in their prime from March to July, after which they deteriorate, and, a month or two later, die after spawning in the shallow upper waters. Multitudes of living embryos have been sent to Europe and even Australia by the Fish Commission.

In regard to the great number of S. in the rivers of the northwest, J. K. Lord, in his work, *The Naturalist in Vancouver Island* (1866), says: 'At Fort Hope, on the Fraser River, in the month of September, I was going trout-fishing in a beautiful stream, the Qua-que-alla, that comes thundering and dancing down the Cascade Mountains, cold and clear as crystal; these salmon were then toiling up in thousands, and were so thick in the ford that I had great trouble to ride my horse through: the salmon were in such numbers about his legs as to impede his progress, and frightened him so that he plunged viciously, and very nearly had me off.'

The Indians of these regions take the salmon, as they ascend the rivers, by various contrivances. They construct weirs reaching from one side of a stream to the other, with openings through which the fish pass into large lateral prisons of closely woven wicker. They use nets in the bays and harbors, when the salmon, pursuing anchovies and herrings, run into the net, and are caught in immense numbers. They construct rude scaffolds or stages of wood among the bowlders on the sides of large rivers, on each of which many Indian fishers await the salmon, with small nets fasted to handles 40 or 50 ft. long. Thirty salmon an hour is not an unusual take for

two Indians to land on a stage. Another and more curious method, practiced at falls, is by means of great wicker hampers, about 30 ft. in circumference, and 12 ft. in depth, which are fastened to the smaller ends of huge trees placed so as to overhang the foaming water, and where the salmon generally leap: in each basket two naked Indians are stationed to catch and kill the fish that fall into the baskets. Salmon in the region above indicated are put up for export in tin cans; this industry is on a great scale—employing hundreds of vessels and thousands of persons.

Atlantic Salmon.—Its original natural range in America stretched from Greenland to Long Island Sound.

The vast abundance of salmon was one of New England's chief recommendations to immigration in colonial days. The Merrimac is reported to have been so filled with them during the spring migration that they sometimes crowded those near the banks out on dry land. Even as late as 1783 Peters reported in his *History of Connecticut* that the 'shad, bass and salmon more than half support the province.' There is no good reason to suppose that they did not originally run in the Hudson, although direct evidence that they did so in abundance is lacking. DeKay mentions that one was taken in 1840, Aug., near Troy, N. Y., weighing 40 pounds. Long before that year, however, the New York market had ceased to be supplied from the Connecticut, and had begun to bring salmon from the Kennebec, packed in ice. In the Saint Lawrence, however, few if any salmon entering the river from the sea ever ascended as far as Lake Ontario, and the salmon inhabiting that lake and its tributaries have always, as a rule, made the lake their sea, and the limit of their downward migrations. The reason for the decline was everywhere the same—overfishing in the rivers with seines, and the damming of the upper streams for milling or other purposes. Although Peters had recorded that in 1783 salmon 'fill the Connecticut river for many days, and no finite being can number them,' the Rev. D. D. Field stated in 1819 that they had scarcely been seen there for '15 or 20 years.'

Artificial Propagation. The first steps in an effort to restock with salmon the rivers of the eastern coast were undertaken by Massachusetts and New Hampshire about 1865. At first eggs were obtained from Canada, but this source was cut off, and the authorities were compelled to attempt to get eggs by capturing salmon in the spring at the mouth of the Penobscot river, in Maine, and keeping them alive and well until they spawned in November. After some experimenting a few live salmon were safely caught and carried in floating cars to Craig brook, near the mouth of the Penobscot, where ponds and hatcheries fed by a clear stream had been prepared for them. The fish throve; year by year quantities of eggs were obtained and despatched to other places to be hatched. In 1889, however, the Craig Brook station was acquired by the

U. S. Fish Commission and enlarged into a regular establishment for the rearing of fry, on an extensive scale, to the age of six or seven months. Later other establishments were opened for the rearing and distribution of the landlocked salmon. Still more extensive operations in salmon culture have been undertaken on the Pacific coast to replenish the rivers of California and the Columbia basin, from 40 to 50 millions of fry (principally quinnat) are annually being artificially hatched, reared and placed in the headwaters of the various rivers.

SALMON: a river in Idaho, which rises in Custer co., flows n. and w. into Snake river. Its course is irregular; its total length is about 400 m.

SALMON DANCE: among the American Indians, a dance of the Yurok, Karok and other tribes, held in the early spring on the Pacific coast when the salmon begin to run up the rivers. No one is permitted to catch a salmon before the dance, nor for 10 days afterward.

SALMON-TROUT: a name applied to several distinct species of *Salmonidæ:* in the eastern United States to the great lake trout (*Cristivomer* or *Salvelinus namaycush*) which resembles the true chars or trouts except for the crested and toothed vomer bone and prominent teeth on the base of the tongue. The color varies greatly, but is usually dark gray with numerous well separated rounded spots of lighter gray. This species reaches a length of upward of three feet, and has been known to attain a weight of 125 pounds. It is especially characteristic of the Great Lakes, but is found in fresh waters from Maine to Vancouver and northward to Alaska. Except when spawning in the autumn they live in the deeper waters of the lakes and are extremely voracious. Next to the whitefish the lake-trout is the most important food-fish of the Great Lakes, and is caught chiefly by means of extensive gill nets operated by tugs. In order to maintain the fisheries many millions of eggs are now hatched artificially, both by the United States and by the Michigan Fish Commissions. In the west the steelhead salmon (*Salmo gairdneri*) and related species are sometimes known as salmon-trouts. The steelhead resembles the rainbow trout, but is very much larger, has small scales and a larger mouth. It is abundant in nearly all of the rivers of the Pacific coast, from California to Alaska, and is caught in considerable quantities for canning, and, when captured in the fall immediately after leaving the sea, is esteemed as a fresh fish. The common Atlantic salmon (*Salma salar*) also sometimes receives the name of salmon-trout, as in the Gulf of Saint Lawrence. The salmon-trout of Europe (*Salmo trutta*), also known as bull-trout and sea-trout, occurs in the Baltic Sea, about the British Isles and along the coast of France, and enters the rivers emptying into these seas. Its life history resembles that of the common salmon, with which it readily hybridizes.

SALMON'IDÆ: a family of highly organized fresh-water and anadromous fishes of the northern parts of the world, which includes the salmon, salmon-trout, white-fish, grayling and their relatives. See SALMON.

SAL'OL, phenyl-salicylate, $C_6H_4.OH.COOC_6H_5$: a drug obtained by the interaction of salicylic acid and phenol. A white crystalline powder odorless or with a faint aromatic smell, nearly tasteless, almost insoluble in cold water, easily so in alcohol, ether, or chloroform. A powerful antipyretic but chiefly used as an intestinal antiseptic. In the small intestine it is decomposed by the pancreatic juice into phenol (or carbolic acid) and salicylic acid, both of which are well known antiseptics. Used therefore in cases of typhoid fever, fermentative dyspepsia, and in other diseases of the intestinal canal. As it contains salicylic acid it is valuable in cases of rheumatism, gout, etc. Dose from 15 to 30 grains.

SALOME: a Hebrew female name, common in Palestine in the days of Jesus Christ. The most notable bearer of it was the granddaughter of Herod the Great, born 10 A.D., who married her uncle, Philip the tetrarch. She appears in the gospel as a young girl, who is instigated by her mother Herodias to ask of Herod Antipas the execution of Saint John Baptist. The name was also borne by the mother of James the Elder and John the Evangelist, one of those women of Galilee who attended Jesus in his journeys and ministered to him.

SALM-SALM, *sâlm'sâlm*, FELIX, Prince: 1828, Dec. 28—1870, Aug. 18; b. Austria. During the civil war in the United States he was in the Union army, acting as colonel, and afterward, with the rank of brigadier-general, he had command of a post at Atlanta, Ga. Subsequently he was aide-de-camp to Prince Maximilian in the invasion of Mexico, taken prisoner, and released; his wife (formerly Miss Le Clercq, of New York) having made notable exertions to save Maximilian. Returning to Europe, Prince Salm-Salm was major of Prussian royal guards in the Franco-Prussian war, and was killed in the battle of Gravelotte. See *Ten Years of My Life* (1875) by the Princess Salm-Salm.

SALOMON, *sâ'lo-mon*, HAYM: American patriot and financier: b. Lissa, Poland, 1740; d. Philadelphia, Pa., 1785, Jan. 6. His record as an American patriot and his services in aid of the government in Revolutionary days are well known. He was called 'the good Samaritan' by S. H. Gay in his life of James Madison, and is referred to by Madison as rejecting all recompense for the pecuniary help bestowed. He was a prisoner in New York in 1775, and in 1778 escaped to Philadelphia. There acquiring wealth as a banker, he freely loaned to Robert Morris over $350,000. He negotiated all the war subsidies from France and Holland, and when Continental money was withdrawn, causing suffering among

the poor of Philadelphia, he distributed $2,000 in specie to relieve distress. The large indebtedness of the government to Haym Salomon was never repaid to him nor to his heirs and has been the subject of some discussion. It was favorably reported to the United States senate in 1850. Although the amount of public securities and Revolutionary papers filed in the register's office, Philadelphia, 1785, Feb. 15, reached $353,744, the inroads of the British army in 1814 destroyed every record in relation to the vouchers. On Feb. 24, 1893, a bill was presented to the House that a gold medal be struck off in recognition of Haym Salomon's services, his heirs to waive all claims for indemnity; but the measure was too late for consideration.

SALOMON, JOHANN PETER: musician, violin player, and composer: 1745-1815; b. Bonn. When young, he was attached to the service of Prince Henry of Prussia, for whom he composed several operas. In 1781, he visited Paris, and afterward London, where his reception was so cordial that he settled there. His series of subscription concerts in London, 1790, form an era in the history of music, as they led to the production of Haydn's 12 grandest symphonies, known as the Salomon set. In 1800 Salomon retired from public life. He was interred in Westminster Abbey.

SALON, *sâ-lawng'* [F. *salon* (see SALOON)]: drawing-room; saloon; exhibition of the fine arts in large apartments; gallery of paintings, etc., of living artists. The *salon* was, socially and distinctively, the habitual and informal gathering of intimates of a select sort, for conversation, at the houses of socially prominent persons in Paris, in the last three centuries. The only known example in ancient times, the resorting of distinguished Greeks to the house of Aspasia for social reunions, was a type of the modern salon, save that only exceptionally has the mistress of the mansion been notorious. In most salons the hostess has been the wife of the proprietor of the house, and, like Aspasia, of marked gifts and graces, attracting men of intelligence and position, and reigning within her circle as a queen. In the 16th century the salon had become an established institution, dating especially from literary Marguerite d'Ecosse and Marguerite of Navarre, and the celebrated beauty Madame Paulet, in the time of Henry IV. of France. In the 17th century the salon began to exert a powerful influence on public affairs. Sometimes, it became a philosophical reunion, as that of the Princess of Robecq, where Palissot conceived his comedy of *The Philosophers;* in other instances, a company of religious devotees, as that of the Countess of La Marck. The salon of Madame de Grammont was the first verily political. In the 18th century there were financial salons, as those of Bernard and John Law. The Club grew out of overflowing salons, which it began to dethrone about

1790. Madame de Staël's S. was one of the disturbers of Bonaparte. At the Restoration, the wife of the painter Lebrun had a S. of legitimists, with music as an attraction; and, toward the middle of this c., an example was the literary S. of Madame de Girardin. After the revolution of 1848, reunions were few and political; now they are only official or merely social. '*Les salons sont morts.*' In the United States there have been a few short-lived literary salons, as those of Rufus W. Griswold and Miss Lynch (afterward Madame Botta) of New York, and Mrs. James T. Fields of Boston. To flourish, the S. needs the lost art of conversation, especially as it was cultivated in France.

SALON' DES BEAUX ARTS (familiarly THE PARIS SALON): exhibition of paintings, sculptures, etc., by the Paris Acad. Louis XIV., advised by Colbert, requested the members of the Acad. to institute an annual exhibition, which, however, Colbert changed to biennial, the first exposition opening 1667, and followed by biennial exhibitions until the first republic, when the S. occurred every year, but became biennial again under the empire. Under Louis XV. the S. was held in the Louvre, and assumed its present name. In 1737 there were 286 works by 69 artists, of whom 10 were sculptors and 8 engravers. The numbers increased until in 1765, when there were 432 works, then diminished until 1791. Only academicians and professors had right to exhibit. The Revolution destroyed this exclusiveness; and half the jury of selection were drawn by lot. In 1785 the custom began of re-arranging paintings, after the time of exhibition had half expired, to give the poorly-lighted a better position. In 1804, there were 701 works by 315 artists; in 1812, 1,299 by 557. On the re-entry of the Bourbons, the command was given to replace tricolor cockades with white in battle pictures of the empire; but the artists refused. In 1824, there were 2,371 works by 790 artists; and lithographs were then first admitted. The revolution of 1848 swept away the juries that had proscribed the works of Rousseau, Diaz, Corot, etc.; 5,180 works were admitted, without selection, and committees were elected by universal suffrage of artists. After the *coup d'etat* of 1852, some of the jury were artists formerly rejected, and some were appointed by the administration—three-fourths after 1863, when the exhibitions became annual. After 1872, no pictures were exempt from liability of rejection, and the jury was elected by those who had won the grand prize of Rome; but in 1874 the exemption and mode of election were restored. In 1889, the Société Nationale des Beaux Arts was founded as a protest against the awards of the International Exposition of that year, their annual exhibition held from May 15 to July 15 follows that of the Paris Salon held from May 1 to June 22, and affords interesting comparison.

SALO'NA: see SPALATO.

SALONICA, *sâ-lō-nē'kē*, or SALONIKI, *sâ-lō-nē'kē* (anc. *Thessalonica*, Turk. *Selanik*): town of European Turkey, in the vilayet of S., and, next to Constantinople, the greatest emporium of commerce in the empire; on the Gulf of Saloniki, and rising from the shore along the face of a hill. The city is inclosed by white walls, partly ancient and partly mediæval, about five m. in circuit; and is surrounded by cypresses and other evergreens. From the sea, it presents a bright and beautiful appearance: but its internal aspect is miserable. The principal buildings are mosques, most of which were previously Christian churches. The *Citadel*, called by the Turks Vedi-Kuleh, or 'the Seven Towers,' is the ancient Acropolis; within it are to be seen the ruins of a triumphal arch belonging to the time of Marcus Aurelius. Other relics of antiquity are the Propylæum of the Hippodrome, a magnificent Corinthian colonnade of five pillars; the triumphal arch of Augustus, erected after the battle of Philippi (now forming the gate of Vardar or Vardari); the arch of Constantine, etc. S. exports the corn, cotton, wool, tobacco, beeswax, and silk of Macedonia, and is connected by railway with Uskub, nearly 100 m. inland. A new enterprise of German and Austrian origin is the Turko-Servian railway, connecting Berlin and Vienna with S. on the Ægean Sea. The exports have annual value of about $12,500,000; imports of about $6,250,000.—Pop., Turks, Greeks, and Jews, estimated 121,600.

S. was at first called Therma, under which designation it is mentioned in connection with the march of Xerxes through Greece. It was rebuilt by Cassander about B.C. 315, who probably named it Thessalonica in honor of his wife; and during the Roman-Macedonian wars, it figures as the principal station of the Macedonian fleet. After the civil wars, its prosperity rapidly increased, and for three centuries it was the first city in Greece. It was early the seat of a Christian church. During the barbarian invasions, it proved the great bulwark of the Eastern empire. It was thrice taken in the middle ages—by the Saracens 904; by the Sicilian Normans 1185; and by the Turks under Amurath II. 1430.

SALOON, n. *sa-lôn'* [F. *salon*, a large hall—from *salle*; It. *sala*, a hall: Icel. *salr*; Ger. *saal*; AS. *sele*, a hall]: great hall or state-room, in a house, vessel, etc.; spacious apartment for reception of company (see SALON); in the *United States*, a place where liquors are sold and drunk.

SALOOP, n. *sa-lôp'*, or SALOP, n. *săl'ŭp:* decoction of salep sweetened: see SALEP. Also, root-beer flavored with Sassafras (q.v.), formerly much sold in streets of London.

SALOP: see SHROPSHIRE.

SALPA, *săl'pa:* genus of *Tunicata*, in which there is no shell, but a leathery tunic with two apertures; type of the family *Salpidæ*, which float in the sea, and have the tunic transparent and elongated. They are allied to the *Ascidia*, though not fixed like them, and have two openings, through the hinder of which the water enters, and is expelled through the anterior by a regular contraction of the mantle, so that the animal is impelled backward through the water without apparent voluntary action. The *Salpæ* are sometimes solitary, and sometimes united in long chains, those in chains having the contractions of the individuals simultaneous; but the solitary *Salpæ* appear to be the parents of those in chains, and these in turn give birth to solitary individuals very different from themselves. The whole texture is very delicate, so that the animal is sometimes scarcely to be discerned, except from its iridescent hues in the sunshine, which make chains of *Salpæ*, when very numerous, a conspicuous feature in the surface of the tropical ocean. The orifices of the alimentary canal are not near together, as in *Ascidia*, but at opposite extremities of the body. The branchial chamber of *Ascidia* is represented by a wide membranous canal, traversed by a long vascular ribbon continually exposed to the water that passes through the canal. The *Salpæ* united in chains have no organic connection, but apparently adhere together by little suckers.

SALPICON, n. *săl'pĭ-kŏn* [Sp.—from L. *sal*, salt; Sp. *picar*, to prick]: in *OE.*, a mixture of various meats and vegetables previously cooked, made into small patties with good puff pastry.

SALPINX, n. *săl'pĭngks* [Gr. *salpingx*, a trumpet]: in *anat.*, the Eustachian tube, or channel of communication between the mouth and ear; and the Fallopian tube, or channel of communication between the ovary and the uterus.

SALSES, n. plu. *săl'sēz* [L. *salsus*, salted, briny—from *sal*, salt: It. *salso*, salt]: eruptions of hot acidulated mud from small orifices, generally in volcanic districts, and often accompanied with the emission of steam and gases at a high temperature, sometimes inflammable.

SALSETTE, *sâl-sĕt'*, Port. *sâl-sĕt'tā* (native name *Sáshti*): island on the w. coast of British India, in the presidency of Bombay; immediately n. of Bombay, with which it is connected by a long peninsula, and by an artificial embankment called Zion's Causeway. It is 18 m. long, and 11 m. in extreme breadth; 241 sq.m. It is beautiful, picturesque, and densely wooded, is diversified by mountain and hill, and contains many fertile tracts. Sugar, indigo, cotton, flax, and hemp are grown. Thanah, the chief town (pop. about 12,000), is on the e. coast, 20 m. n.n.w. of Bombay by the Great Indian Peninsular railway, which, after traversing the islands of Bombay and Salsette, crosses to the continent half a mile s.

of this town. Nearly a hundred remarkable caves, the Caves of Kánhari or Kenery, are in the middle of the island, five m. w. of Thanah. They all are excavated in the face of a single hill, and contain elaborate carving. The caves are in six stories, on the ledges of the mountain; and the stories are connected by stairs cut in the rock. The cave first approached consists of three chambers, one unfinished, and dates from the 9th or 10th c.; it contains no figures or carvings. The other caves contain numerous carved representations of Buddha, many of colossal size. Relics and inscriptions are found. There are caves in several other localities of the island—e.g., those of Montpezir, Magatani, and Jageshwar. The caves are frequently the haunts of serpents and tigers. On the n., on the coast, is the small watering-place Ghorá Bandar, which has been termed the Montpellier of Bombay. The fort of Thanah and the island of S. were taken by the English 1774. Pop. of S. 108,000, of whom about three-fourths were Hindus.

SALSIFY, n. *săl'sĭ-fĭ* [F. *salsifis;* Sp. *salsifi*—from It. *sassefrica*, goat's-beard], (*Tragopogon porrifolius*): biennial plant growing in meadows throughout Europe; cultivated in gardens for its root, which is used in the same manner as the carrot, and is delicate and pleasant, with a flavor resembling asparagus or scorzonera. It is also known as the oyster plant. The root is long and tapering, and in cultivation white and fleshy, with much white milky juice; the stem 3–4 ft. high, with smooth and glaucous leaves, which resemble those of the leek; the flowers are of dull purple color. The seed is sown early in spring in rich soil which has been deeply plowed and thoroughly pulverized. Rows should be 1 ft. apart, the plants thinned to 4 in. apart in the rows, and carefully cultivated. It is ready for use late in the fall, but roots not wanted sooner may remain in the ground till spring, and will be improved by frost. Far n. slight winter protection is required. If allowed to grow the second year the roots will be worthless, but the flower-stalks can be used like asparagus. Until recently S. has been grown but little in the United States, but its cultivation in the vicinity of large cities is rapidly increasing. The seed of four varieties is offered by dealers.—The genus *Tragopogon* belongs to the nat. order *Compositæ*, sub-order *Cichoraceæ*, and is distinguished by one row of 8–10 bracts united at the base, a punctured receptacle, feathery pappus, and striated achenia with long beak.—The PURPLE GOAT'S BEARD (*T. pratensis*), was formerly cultivated in England for its roots, similar in quality to salsify.

SAL-SODA, n. *săl-sō'da* [L. *sal*, salt, and Eng. *soda*]: in *Amer.*, a commercial name for carbonate of soda.

SALSOLA, n. *săl'sō-la* [L. *salsus*, salted, salt]: a genus of plants found chiefly on the sea-shore, yielding *kelp* and *barilla*, ord. *Chenopodiaceæ;* salt-wort.

SALSUGINOSE, a. *săl-sū'jĭ-nōs:* in *bot.*, growing in places overflowed by salt water.

SALT, n. *sawlt* [L. *sal;* Dan. and Sw. *salt;* Gael. *salann*, salt: W. *halen*, salt; *hallt*, salted: Gr. *hals*, salt, the sea]: a common culinary substance obtained from sea-water, salt-springs, and from mines; in *chem.*, called chloride of sodium or sodic chloride (see SALT, MANUFACTURE OF): term applied to a combination of an acid with an alkaline base (see SALTS, THEORY OF): that which preserves from corruption; *figuratively*, wit; piquancy; *familiarly*, a sailor, as an *old salt:* ADJ. having the taste of salt; impregnated with salt; in *OE.*, lecherous; lustful; libidinous; V. to season, sprinkle, or impregnate with salt. SALT'ING, imp.: N. the act of impregnating with salt (see below). SALT'ED, pp. SALT'ER, n. *-ėr*, one who salts; a salt-seller; a dry-salter. SALT'ERN, n. *-ėrn*, salt-works; a salting-tub. SALT'LESS, a. *-lĕs*, without salt; insipid. SALT'ISH, a. *-ĭsh*, a little salt. SALT'ISHLY, ad. *-lĭ*. SALT'ISHNESS, n. *-nĕs*, a moderate degree of saltness. SALT'LY, ad. *-lĭ*. SALT'NESS, n. *-nĕs*, the quality of being salt; taste of salt. SALTS, n. plu. *familiarly*, Epsom salts. SALT-CAKE, impure sulphate of soda, formed from oil of vitriol and common salt, in the preparation of carbonate of soda. SALT-CELLAR, n. *-sĕl'lėr*, or -SALER, n. *-sā'lėr* [F. *salière*, a salt-cellar— *-celler* or *-saler* being a corruption of F. *salière*]: a vessel for holding salt, formerly of massive silver, and placed in the centre of the table. SALT-JUNK, hard salt beef for use at sea. SALT-MARSH, grass-land subject to be overflowed by sea-water. SALT-MINE, a place from which rock salt is dug. SALT-PAN, the vessel in which salt is made from salt water. SALT-WATER, sea-water, as opposed to spring or river water; water impregnated with salt. SALT OF LEMONS, binoxalate or acid oxalate of potash. SALT OF SORREL: same as SALT OF LEMONS; common name for binoxalate of potash (see OXALIC ACID). SALT OF TARTAR, commercial name for very crude carbonate of potash. SALT OF VITRIOL, sulphate of zinc. SALT OF WORMWOOD, carbonate of potash. TO SALT AN INVOICE OF ACCOUNT, to charge extreme prices for the articles in it. TO SIT ABOVE THE SALT, *formerly*, to sit in the place of honor—the salt-cellar being placed in the middle of the table, the favored guests sat above it, and the inferior below it.

SALT, MANUFACTURE OF: the obtaining and preparation of sodium chloride in desirable form: see SODIUM. Common salt is procured either in the solid crystalline state, called *Rock-salt* (q.v.), or as a natural brine from wells or springs, or by evaporation of sea-water. Rock-salt is obtained by mining, often at great depths, as at Norwich in Cheshire, England; at Salzburg, Magdeburg, Berchtesgaden, and Wimpfen in Germany; Cracow in Poland; in various places in the United States; in the Punjab and other parts of the world. Rock-salt almost

always contains impurities, and therefore is dissolved in water, and the insoluble matters mixed with it are deposited at the bottom. The brine is then drawn off, and evaporated by artificial heat in large iron pans.

Natural brine is obtained by sinking shafts in which the brine rises to the surface, and overflows if not pumped. Having been pumped into reservoirs, it is distributed to the various works, which are little more than large sheds with numerous openings in their roofs to allow the steam free egress. Flues run from end to end of the floors, and on these rest the iron evaporating-pans. The flues heat the brine nearly to boiling-point, and as a large surface is exposed, the evaporation is very rapid, and the crystals are small, as in the fine table-salt. If, however, the heat is more gentle, the salt is coarser, and is fit for curing meat, fish, etc.; and when very slow, a much coarser kind, *bay-salt*, is produced. Salt is obtained from sea-water in many parts of the world, and this is effected by simply evaporating it in brine-pits or shallow square pools dug on the shore for the purpose. When the evaporation has proceeded to a certain extent, the liquid assumes a reddish color; a pellicle of salt forms on its surface, which soon breaks, and sinks down, to be followed by another; and the crystallization then proceeds rapidly. When complete, the salt is removed to sheds open at the sides and then piled in heaps in order that the chloride of magnesium may be removed; this is easily done, for as it is extremely deliquescent, it liquefies by exposure to the atmosphere, and runs out. The salt is then redissolved and crystallized, if great fineness is required. In Russia, Sweden, and other northern countries, salt is obtained by freezing sea-water in large reservoirs. As the ice formed is nearly pure, repeated freezings of the surface, and removal of the ice, leaves the mother liquor more and more rich in salt, and it is then boiled down.

In the United States, comparatively little salt is made from sea-water; though at some period nearly every Atlantic state has engaged in the manufacture, and during the revolution, the war of 1812, and at about 1830, the New England states produced large quantities of sea-salt. The salt springs of N. Y. were utilized by the whites 1788, near Syracuse, where the state has reserved the salt-fields, and leased salt-lots since 1797, at a charge of 6 cts. a bush. to 1846, and of one cent since. The production reached (1791) 8,000 bushels; (1797) 25,474; (1807) 165,448; (1817) 448,665; (1827) 983,410; (1837) 2,161,287; (1847) 3,951,351; (1862) 9,053,874; and from this maximum a declining amount, down to less than one-tenth of this. The salt-wells are mainly in the low marshy lands surrounding Onondaga Lake, which has a double bottom of marl 3 to 12 ft. thick, and marly clay under that, preventing the lake water from reaching the brine of the salt-wells, which are 200 to 300 ft. deep. The brines from these wells have yielded a bushel of

dry salt (56 lbs.) for from 30 to 45 gals. of brine. A great decline of production has resulted from competition with Michigan salt, the mining of which costs less; also from the opening of other New York fields. Within the state reservation at Syracuse, test wells fail to find more or stronger brine, while outside of it, about five m. from Syracuse, a bore through shale, 735 ft., and limestone below it, reached, at 1,210 ft., rock-salt, which can be converted into saturated brine, taken by a system of piping to the city, and converted into salt at one-third less cost than brine from the state wells. There is a practically inexhaustible supply in the salt-beds of w. New York. They extend about 120 m. e. to w. and 50 m. n. to s.; and show an average thickness of 40 ft. over nearly 5,000 sq.m. The brine from this field has a less than usual proportion of the chlorides of calcium and magnesium, thus reducing the cost of production of pure salt. At Warsaw, Wyoming co., N. Y., the deep bed of rock-salt is quarried, with a large force of men, and many tons of daily output; it is so pure that it can be pulverized for table use. In the w. part of Pennsylvania a salt region on the Allegheny and Beaver rivers began production 1812, and 1829 had extensive works supplying salt at 20 to 25 cts. a bushel, when it sold at 50 cts. in Kentucky, Ohio, and Illinois. The output was 900,000 bushels (1857), and 1,011,800 (1860); but from that it has declined. In West Virginia salt production in the valley of the Great Kanawha, from Charleston to about 20 m. above, had reached (1829) 1,000,000 bushels, and (1870) 4,633,000; but later this fell off very much. In the region of s.w. Virginia, along the n. fork of the Holston river, occur both salt-springs and rock-salt. From 1798 the old Scioto salt-wells in Ohio yielded an inferior salt. With wells at Pomeroy 1,200 ft. deep, strong brine raised the production to (1850) 550,350 bushels, and (1873) 4,154,187 bushels. In Kentucky, Maryland, and Illinois there has been some salt production, but not of permanent importance. From 1859, when a state bounty of 10 cts. a bushel was offered, salt production began in Michigan, at E. Saginaw, and was rapidly developed, the output reaching (1874) 5,134,875 bushels. The state now has nine districts with a manufacturing capacity of about 6,000,000 bbls.

In Reno co., Kansas, borings made 1887 reached, at about 500 ft. depth, a bed of pure salt 300 to 400 ft. thick, except two or three thin layers of soapstone. For a distance of many miles the field is estimated to have 2,000,000 bbls. of salt to every acre; 13 factories are engaged in production from this bed. Near Cleveland, O., recent borings have opened several thick veins of salt, at 2,500 ft. depth for the first, 50 ft. below that a second, 80 ft. below a third, and at a depth of 3,400 ft. a vein of so great thickness as to induce closing the well (bored for gas), and establishing mining for salt. In Louisiana,

on the coast w. of the mouth of the Mississippi river, a cluster of islands known as Petite Anse Isle contains beds of salt said to be the purest in the world—99 per cent being pure salt. The main bed has a depth of 300 to 400 ft., and mining to a very large extent has been developed, 1889-91. The accidental discovery, 1861, of this deposit, a solid mass of pure salt under a mere drift mass 16 to 18 ft. deep, was of the greatest value to the south in the civil war, during the later years of which the Confederate salt supply was chiefly from this source. The production of salt in the U. S. had become centered by 1870 in the Michigan, New York, and Ohio areas, with output of nearly 16,000,000 bushels, representing about 200 establishments, while 82 other establishments yielded enough to raise the aggregate to 17,606,000 bushels. Both in New York and in Ohio production has suffered from the fact that in Michigan the brines are much stronger and fuel much cheaper, giving Michigan salt a great advantage; while in Canada a similar advantage is possessed by the salt-producers at Goderich, on Lake Huron, where the output, dating from 1866, rose to several millions of bushels annually. In the Rocky Mountain and Pacific coast region local production of salt has been widely attempted or is in prospect, especially in California, Utah, Colorado, Idaho, and Nevada. The production of salt in the United States, 1907, was 29,704,128 barrels, valued at $7,439,551.

SALT, SPIRITS OF: old name for muriatic or hydrochloric acid.

SALT, *sawlt*, Sir TITUS: public-spirited English manufacturer: 1803, Sept. 20—1876, Dec. 29; b. Morley. He began business as a wool-spinner at Bradford 1834, and was the first to introduce into England the manufacture of alpaca fabrics. He cherished a strong interest in the welfare of his work-people, and about 1850 established his factory in the healthful valley of the Aire, between Leeds and Bradford. Besides he built the model village SALTAIRE, containing a church, schools, a working-man's club (costing £30,000), baths, etc. The factory covers 12 acres, and there are 1,000 commodious dwellings for the operatives. Salt was returned to parliament 1859, and was made a baronet 1869. His whole career was marked by business enterprise and sagacity, and earnest beneficence. See Life by Balgarnie (1877).

SALTANT, a. *săl'tant* [L. *saltans* or *saltan'tem*, dancing; *salto*, I dance—from *salīrĕ*, to leap]: leaping; jumping; in *her.*, in a leaping position. SALTATION, n. *săl-tā'-shŭn* [F.—from L. *saltātĭōnem*, a leaping, a dancing]: a leaping or dancing; palpitation. SAL'TATORY, a. *-tėr-ĭ* [L. *saltātor*, a dancer]: leaping or dancing. SAL'TATO'-RES, n. plu. *-tō'rēz*, those insects which possess great powers of leaping, as the grasshopper, locust, etc.

SALTER, *sawl'tėr*, WILLIAM D.: naval officer: 1794—1869, Jan. 3; b. New York. He became a midshipman

1809, served on the *Constitution* in the famous battle with the *Guerrière* 1812, and outlived all his comrades in that action. He was at the Brooklyn navy-yard as commander 1856-59, and was a government commissioner for examination of vessels 1863-66. He was promoted lieutenant 1814, captain 1839, and commodore on the retired list 1862. He died at Elizabeth, N. J.

SALTIGRADES, n. plu. *săl'tĭ-grādz* [L. *saltus*, a leap: *gradĭor*, I walk]: a family of spiders that seize their prey by leaping upon it from a distance. SAL'TIGRADE, a. formed for leaping.

SALT'ING: process for preserving animal and vegetable substances for food by aid of common salt. This is either done by rubbing dry salt into the flesh to be preserved, and repeating the process from time to time, until it has absorbed sufficient to arrest decomposition; or the salt is liquefied with a little water, and made into strong brine, in which articles are placed until required for use, when a little soaking and washing removes the superfluous salt. Vegetables are salted in the latter way only; and this is done for their preservation for winter consumption. A little saltpetre is often added, greatly increasing the efficiency of the salt. See ANTISEPTIC; FOOD.

SALTIRE, or SALTIER, n. *săl'tēr* [OF. *saultoir*, a stirrup, St. Andrew's cross: F. *sauter*, to mount—from L. *saltārĕ*, to leap—from *salĭō*, I leap]: in *her.*, an ordinary in the form of St. Andrew's cross—that is, the form of an X—a bend sinister conjoined with a bend dexter. The form of the saltire has been assigned to the cross on which St. Andrew is said to have been crucified; hence the frequency of this ordinary in Scotch heraldry. A saltire is subject to the variations of being engrailed, invected, etc., and may be *couped*. Charges disposed in the form of a saltire are described as placed *saltireways*, or *in saltire*. The former term is more properly applied to two long charges, as swords or keys, placed across one another.

SALTISH, SALTISHNESS. See under SALT.

SALT LAKE CITY: Utah; capital of the state; the central seat of Mormon power; the metropolis of the state and center of trade for a vast region, is finely located on a gentle slope at the western base of the great Wasatch range of mountains. The magnificent mountains behind the city, the lovely valley in front, the stately Oquirrh range beyond the valley and Great Salt Lake, 20 m. to the n.w., add immensely to the attractions of the city. The elevation of the site above sea-level is 4,300 feet. The main portion of the city is laid out in blocks of ten acres each, the streets run at right angles and are 132 feet wide. Being in the arid belt, all vegetation depends upon irrigation, but nevertheless it is a city of gardens, shade-trees and flowers. The city is a central

station for the Rio Grande Western railroad, the southern terminus of the Oregon Short Line railroad, the eastern terminus for the San Pedro, Los Angeles, and Salt Lake railroad, and roads from San Francisco Bay running e. and from Denver running w. meet in Salt Lake.

The Mormons.—Since 1847, Salt Lake has been the headquarters of the Church of Jesus Christ of Latter Day Saints, the home of the president and many of the high officers of the church; the place where the semi-annual general conferences of the church meet in April and October. The Temple, the Tabernacle and Assembly Hall (for winter services and for priestly meetings and consultation), with the Temple Annex, occupy a square. The Tabernacle is a unique structure, 150 feet by 250 feet in size, roofed like a bee-hive, the roof arches being without support over the structure, with comfortable seating capacity for 8,000 people, though not unfrequently 12,000 people gather there. It has the finest pipe organ in America. It is the chief place of worship for the Mormon people, though each of the wards of the city has a meeting-house where services and Sunday schools are held every Sabbath morning, and evening meetings during the week. The Temple is one of the most splendid structures in America. Its walls are of gray Wasatch granite, in solid blocks 9 feet thick at the bottom, 6 feet thick at the top, with a foundation 16 feet thick and 16 feet deep. The interior is finer than was Solomon's Temple. The building is 186½ feet long by 99 feet wide, and is 107½ feet high from foundation to cap stone, while towers and pinnacles extend 50 feet higher. The ground was consecrated and work begun in 1853, it was finished and dedicated in 1893. It is used for marriages, baptisms, and all the secret rites and ceremonials of the Mormon Church. Only the faithful are permitted to enter it. It cost, with furnishings, about $4,000,000.

Public Buildings.—The city has many other fine structures. The joint City and County building, which is also the present State Capitol, is a most attractive building and cost with furnishments $800,000. The Mormon Church Administration building is 330 feet square and 12 stories high. Though called the 'Administration Building,' it will really be a memorial building to Joseph Smith. The city has many imposing business blocks, some of the homes are palatial; the public school-houses are among the noblest in the country. Both the Episcopal and Catholic denominations have great hospitals; the Latter Day Saints have a commodious hospital; there are three private hospitals, while a home for poor and needy miners, built by the charity of Mrs. Mary Judge, and the Saint Ann's Orphanage, built on the charity of Senator Thomas Kearns, are noble structures. The first known surgical operation for the removal of gall stones was performed in Holy Cross Hospital, Salt Lake City. The Latter Day Saints' College occupies several imposing structures, one of which is a Memorial Hall built in honor of Brigham

SALT LAKE CITY.

1. City and County Building.
2. The Mormon Temple.

Young. The Utah State University has a commanding site on the bench e. of the city. The military post of Fort Douglas is three miles e. of the center of the city at an altitude 600 feet above Main street.

Government.—The government consists of a mayor, a council of 15 members, a treasurer, recorder, auditor and two judges elected every two years. The chief of police, fire chief, board of public works, water master, board of health, city physician and building inspector are appointed by the mayor and confirmed by the council.

Religion.—The great majority of the people are Latter Day Saints. They have over 30 places for public worship. But 35 years ago the Roman Catholics established a mission in Salt Lake, a little later built a church and hospital. They now have charge of the great Holy Cross Hospital, the Saint Ann Orphanage, the Miners' Home, Saint Mary's Academy,—All Hallows College for boys and young men, and their new cathedral, one of the finest and largest in the west. A Protestant Episcopal church was founded in Salt Lake in 1867, and two years later a hospital. It now conducts the hospital, has a church and a cathedral and carries on Rowland Hall, a modern high-class seminary for girls and young women. The Methodists came in 1869. They have five churches in the city, and a number of lesser structures where only the Scandinavian language is spoken. A Presbyterian church and school was founded in 1875. Westminster College had been added to its schools, and a new and very fine church is nearing completion. The Congregationalists have a great school and beautiful church. The Unitarians, the Central Christian church, the Baptists and Christian Scientists each have places of worship. The Jews have a fine synagogue. The Josephites, —those who believe that Joseph Smith was a prophet but not a polygamist, have a representation in the city.

Climate.—No better climate can be found than in Salt Lake. In winter the thermometer seldom descends lower than 12 degrees above zero; it seldom reaches 100 degrees above in summer,—it has more clear days than any other city and with the lake, the mountains, the springs and the delicious air, it is a natural sanitarium. The city has warm springs within its limits, and the hot springs 4 m. out, are equal in medicinal virtues to those of Eureka, Ark. In the bathing season trains run every few hours to Great Salt Lake, 25 minutes' ride. The city owns its own water system.

History.—The history of Salt Lake has no counterpart. The first band of immigrants, under Brigham Young, reached the valley July 24, 1847. They were desperately poor. The soil they located on would produce nothing except through irrigation; they were 1,000 miles from any settlement e. or w.; they came as refugees; they were met by desolation; still at their coming they knelt upon the parched soil and held a praise service. Their first

crop was almost a failure, their second was nearly all destroyed by locusts; that they lived through their trials must have been because they had grown superior to distress. But they did live and multiplied. They had disciplined themselves to be content with life's barest necessities; they had few comforts, luxuries they did not even dream of. They had been tossed naked upon the frontier, 'a flaming sword that turned every way' was behind them. Since then there has been much clashing, once the government sent an army against them, but the city has grown and has become a great trade centre; it is the spot from which the Church of Jesus Christ of Latter Day Saints in every land receives direction; it is a beautiful city in itself; its surroundings are altogether august.

Population.—(1880) 20,768; (1890) 44,843; (1900) 53,531; (1910) 92,777.

SALTON SINK: California, the bed of an ancient lake of marine origin, 260 ft. below sea-level, which extended s.e. in the Cahuilla Valley between the San Bernardino and San Jacinto ranges in Riverside and San Diego counties to near the boundary line of Mexico around Yuma. Cut off in prehistoric times from its former outlet in the Gulf of California by the raising of the banks of the Colorado river (q.v.), through silting, the Salton Sea or Sink had eventually dried up and was remarkable for the fertility of its bed and its great deposits of fossil bones of fishes, including whales, sharks, etc., which had been imprisoned by the stoppage of the outlet, and perished with the drying up of the isolated sea. Through the cutting of the Imperial Canal commenced in 1902 for irrigating the Imperial valley, from the Colorado river, the latter during its flood season of 1905-06, forced its way through the newly cut canal, and getting beyond control, converted the Sink, 100 m. e. of it, into a continuously expanding lake, which at the beginning of January, 1906, covered 600 sq.m., extending s. and w. toward the San Jacinto range and n., creeping towards the San Bernardino Mountains, with a depth of from 20 to 30 ft., a few hundred ft. from the shore line. Serious international difficulties were created, the canal having been cut on Mexican soil by United States engineers, without the sanction of the Mexican government. Before the break was closed, and the water diverted to its proper channel, immense damage was done, and the possibility of engineering science almost exhausted.

SALTONSTAL, *sawl'ton-stawl*, GURDON: Congregational pastor, gov. of Conn., and originator of the 'Saybrook Platform': 1666, March 27—1724, Sep. 20; b. Haverhill, Mass. He graduated at Harvard 1684, was pastor at New London, Conn., 1691-1707, in the latter year having been chosen gov. of the colony, on the death of his parishioner, Gov. Fitz-John Winthrop, dur-

ing whose illness he had acted as representative of the office. The Saybrook convention was suggested by him, and the platform in part shaped by him. He was active in raising troops for the conquest of Canada; in establishing the first printing press in the colony; and in removing Yale College to New Haven. By reëlections he continued gov. till his death, at New London.

SAL'TONSTAL, LEVERETT, LL.D.: lawyer: 1783, June 13—1845, May 8; b. Haverhill, Mass.; son of Dr. Nathaniel S. He graduated from Harvard College 1802, and after studying law commenced practice in Salem, Mass., 1805. He was several times elected member of the state legislature, was speaker of the lower house and pres. of the senate, was the first mayor of the city of Salem, was presidential elector 1837, and member of congress 1838-43. He was a member of various learned societies. By his will he provided for increasing the Harvard College library, and gave most of his own books to the Phillips Exeter Academy.

SALTPETRE, n. *sawlt-pē'tėr* [L. *sal petræ*, the salt of rock—from *sal*, salt; *petræ*, a rock or stone: Ger. *salpeter:* F. *salpêtre*]: nitre, a salt formed by combination of nitric acid with potassa: see NITRE.

SALT RANGE, or KALABAUGH MOUNTAINS, *kâ-lâ-bâg':* mountain range in the Punjab, India; lat. 32° 30′—33° 20′. The range rises on the w. bank of the Jhelum, runs w. to the Indus, and after affording passage for the river, reappears on its w. side, and pursues the same direction till it meets the Suleiman Mountains. The Salt Range is about 200 m. in length, and 2,000 to 5,000 ft. high. Its appearance is exceedingly bleak and barren; vegetation is rare; there are no trees; and the frequent bold and bare precipices give it a forbidding aspect. Rock-salt is found in inexhaustible quantities, and so pure that after being pounded it is ready for use. Alum, iron ore, coal, gypsum, and limestone abound; graphite is found, and gold-dust is washed down in the rivers.

SALT RIVER: (1) in Kentucky, has its rise in Boyle co., in the central part of the state; from whence it flows n., then w., then n. by w. to the northern boundary of the state, where it enters the Ohio at Westpoint, about 20 m. s.w. of Louisville. It is about 100 m. long; and the chief tributaries are Rolling Fork and Beech rivers. (2) A river in Missouri, which has its source in Schuyler co., in the n.e. part of the state, flows s. by s.e. to Monroe co., turns e., then n.e. and s.e., and enters the Mississippi near the town of Louisiana, in Pike co. It is about 200 m. long.

SALTS: a very important class of substances in chemistry. The word salt was first used to designate the solid residue obtained by evaporation of sea water, and as sodium chloride is its chief constituent the term *salt* got to mean popularly that substance alone.

SALTS.

Many other substances besides common salt are known by the general name *salts* because of their similarity to common salt in general physical properties, such as solubility in water, taste, having crystalline form, etc. Some of the most common are saltpetre, smelling salts, etc.

The chemical meaning of the term salt is quite another thing. While the substances mentioned above are indeed salts in the chemical sense, many other substances, as oil of wintergreen, for example, that have none of the physical characteristics of common salt, must also be included under this term. To the chemist, a salt is a chemical compound that may be considered as derived from an acid by the replacement of part or the whole of the hydrogen of the acid by a metal or a 'radical' playing the part of a metal. For example, the salt sodium nitrate, $NaNO_3$, is derived from the acid HNO_3, by the replacement of the hydrogen by the metallic element sodium, Na; also ammonium chloride NH_4Cl is derived from the hydrochloric acid HCl by similar replacement of hydrogen by the radical NH_4. The most general chemical conception of the composition of salts is that which formulates them as MxNy, where M is the basic or positive portion and N the acid or negative part of the salt. Either M or N may be either elementary atoms or groups of different atoms acting as single atoms (radicals). Examples AgCl, $Ag(NO_3)$, NH_4Cl, $(NH_4)_2$, (SO_4).

Salts are formed in many ways; one of the most important being by the action of an acid on a base by which water and a salt are formed, the salt differing in properties both from the acid and base used. Thus hydrochloric acid and potassium hydroxide mutually react, the products being potassium chloride and water. $HCl+KOH=KCl+H_2O$. Salts are frequently formed by the action of an acid on a metal. Zinc and sulphuric acid forming the salt zinc sulphate and hydrogen $Zn+H_2SO_4=ZnSO_4+H_2$. A very common method for the formation of salts is by the process called double decomposition, whereby two new salts are formed when solutions of two salts are brought together. When a solution of barium chloride is added to a solution of sodium sulphate a white solid separates which is a new salt barium sulphate, while in the solution is another new salt, sodium chloride. $BaCl_2+Na_2SO_4=BaSO_4+{}_2NaCl$.

Salts are often classified as normal, acid, basic, and double. An acid having more than one hydrogen atom replaceable by basic atoms or groups may form both acid and normal salts according to whether a part or whole of that hydrogen is replaced. Sulphuric acid H_2SO_4 can form acid salt $KHSO_4$ and the normal salt K_2SO_4. An acid having three replaceable hydrogen atoms can form three varieties of salts. Phosphoric acid H_3PO_4, for example, can give two acid salts KH_2PO_4,

K_2HPO_4 and a normal salt K_3PO_4. A basic salt is one derived from a base having more than one hydroxyl (OH) group and in which all of the hydroxyl groups have not been replaced by acid groups. Basic bismuth nitrate $Bi(OH)_2NO_3$ is derived from bismuth hydroxide $Bi(OH)_3$ by replacement of only one (OH) by the acid group NO_3. An acid salt still contains acid hydrogen and will unite with more base to form a normal salt. A basic salt still contains basic hydroxyl (OH) and will unite with more acid to form a normal salt. A normal salt contains neither acid hydrogen nor basic hydroxyl. The term double salt has been applied to two different classes of compounds, the dividing line between which is, however, often very faint. Acids having more than one replaceable hydrogen atom may form normal salts in which two or more different basic atoms or groups are combined with the acid group, as magnesium ammonium phosphate, $Mg(NH_4)PO_4$ or potassium sodium tartrate $KNa(C_4H_4O_6)$. Another class of double salts is formed by the union of two or more molecules of certain normal salts $K_2SO_4:AL_2(SO_4)_3$, $PbI_2:2KI$, etc.

Method of Naming Salts.—Part of the name is derived from the basic element or group present; thus those containing sodium are called sodium nitrate, nitrate of sodium, or often nitrate of soda, chloride of soda, etc. The other portion is derived from the acid element or group present. Thus salts derived from nitric acid are called nitrates; from hydrochloric acid, chlorides; from sulphurous acid, sulphites; from perchloric acid, perchlorates. It will be noticed that all but the last syllable is the same as the name of the acid and also that this last syllable differs according to the last syllable of the name of the acid. An acid whose name ends in *ic* forms a salt whose name ends in *ate* (see exceptions below). One ending in *ous* forms an *ite* salt. A salt in which the acid part is a single element has the termination *ide,* even though the acid name ends in *ic.* Thus sulphur*ic* acid forms sodium sulph*ate;* sulphur*ous* acid, sodium sulph*ite;* hypophosphor*ous* acid, sodium hypophosph*ite;* hydrochlor*ic* acid, sodium chlor*ide.* Sometimes a metal forms two salts with the same acid in which the number of acid groups united with one atom of the metal varies. Thus iron (ferrum) unites with nitric acid forming two salts, $Fe(NO_3)_2$ and $Fe(NO_3)_3$. The first one containing the smaller number of acid groups is called ferr*ous* nitrate while the other is ferr*ic* nitrate.

The naming of acid salts has called into use a few other terms. The acid sodium salt of sulphuric acid $HNaSO_4$ is called acid sodium sulphate or hydrogen-sodium-sulphate. With an acid like phosphoric, H_3PO_4 having three acid hydrogens we have H_2NaPO_4 di-hydrogen-sodium-phosphate or primary sodium phosphate, HNa_2PO_4 hydrogen-di-sodium-phosphate or secondary sodium phosphate. The normal salt Na_3PO_4 is also called tertiary sodium phosphate.

As has been said the term salt, salts, sal, are often applied to various substances of household or medicinal use. A few of the most common are given below with list of their correct chemical names. Sal soda, sodium carbonate; Epsom salts, magnesium sulphate; Rochelle salts, sodium potassium tartrate; saltpetre, potassium nitrate; sal ammoniac, ammonium chloride; salts of tartar, potassium carbonate; Glauber salts, sodium sulphate.

SALTUS, *sâl'tŭs* EDGAR EVERSTON, LL.B.: American novelist: b. New York 1858, June 8. He was educated at the Sorbonne in Paris, Heidelberg and Munich, and was graduated from Columbia Law School in 1880. His first book was *Balzac: a Study* (1884), which he followed by *The Philosophy of Disenchantment* (1885), and *The Anatomy of Negation* (1886), two works attempting a popular exposition of the theories of Schopenhauer and von Hartmann. Among his novels are: *Mr. Incoul's Misadventure* (1887); *The Truth About Tristrem Varick* (1888); *Eden* (1888); *A Transaction in Hearts* (1889); *The Pace that Kills* (1889); *Enthralled* (1894); *When Dreams Come True* (1895); *The Yellow Fay* (1905); *Lords of the Ghostland* (1907); etc.

SALTVILLE, ENGAGEMENT AT: the extensive salt works at this place, in southwestern Virginia, furnished the Confederate armies their supply of salt. On May 2, 1864, Gen. Crook started from Charlestown, on the Kanawha, to join Gen. Sigel in the Shenandoah Valley, and one column of 2,600 cavalry, under Gen. Averell, was directed upon Saltville to destroy the works, and was afterward to rejoin the main column under Crook. After a very difficult march through mountains Averell reached Tazewell Court House, where he learned that Saltville was well defended, whereupon he abandoned the idea of an attack, and, after a severe engagement at Wytheville on the 10th, joined Crook at Union on the 15th.

Late in September, 1864, Gen. S. G. Burbridge, with a mounted force of about 5,000 men, advanced through eastern Kentucky to Prestonburg and up the Louisa Fork of the Big Sandy on Saltville. He was met 23 m. from Saltville by a small brigade of Confederate cavalry, which delayed him two days, thus enabling Gen. Breckinridge to gather about 3,500 men at Saltville, so that when Burbridge appeared before the place, Oct. 2, he found the salt-works well defended. He made an immediate attack and was stubbornly resisted, but after a hard struggle he gained the right and centre of the Confederate works. The Confederate left resisted all his efforts, and at 5 p. m. Burbridge withdrew from the contest, and abandoning his dead and wounded, marched all night toward Prestonville, thence continuing his retreat. The Union loss was 54 killed, 100 wounded, and 104 captured. The Confederate loss was much less. On Dec. 20, 1864, Gen. Stoneman, with 5,700 men, attacked Saltville, burned the town, and destroyed the salt-works.

SALT'WORT (*Salsola*): genus of plants of nat. order *Chenopodiaceæ*, having hermaphrodite flowers, with 5-parted perianth, and a transverse appendage at the base of each of its segments, five stamens and two styles, the seed with a simple integument. The species are numerous, natives mostly of salt marshes and sea-

Prickly Saltwort (*Salsola kali*).

shores, widely diffused. PRICKLY S. (*S. kali*) has herbaceous prostrate much-branched stems, awl-shaped, spine-pointed leaves, and axillary solitary greenish flowers: it was formerly collected on the shores of Britain, to be burned for the soda which it thus yields. *S. sativa* is the chief Barilla (q.v.) plant of s. Spain.

SALUBRIOUS, a. *sa-lō'brĭ-ŭs* [L. *salūbrĭs*, health-bringing—from *salus*, health: It. and F. *salubre*]: healthful; favorable to health; promoting health. SALU'BRIOUSLY, ad. *-lĭ*. SALU'BRIOUSNESS, n. *-nĕs*, or SALU'BRITY, n. *-brĭ-tĭ* [F. *salubrité*—from L. *salubrĭtātem*]: healthfulness; favorableness to the preservation of health.—SYN. of 'salubrious': wholesome; salutary; healthy; healthful; beneficial.

SALUTARY, a. *săl'ū-tĕr-ĭ* [F. *salutaire*, salutary—from L. *salutāris*, healthful—from *salus* or *salūtem*, health]: promotive of health or safety; healthful; wholesome; contributing to some beneficial purpose. SAL'UTARILY, ad. *-tĕr-ĭ-lĭ*. SAL'UTARINESS, n. *-nĕs*, the quality of contributing to health.—SYN. of 'salutary': wholesome; beneficial; salubrious; advantageous; profitable; useful.

SALUTE, n. *sa-lôt'* [F. *salut*, safety, salutation—from L. *salus* or *salūtem*, health, welfare: It. *salute*, salutation], expression of kind wishes or respects to any one present: mark of respect shown by a soldier raising his hand to his cap, or 'presenting arms,' or by an officer raising his hand to his cap, or, in a march past, lowering his sword: greeting; kiss: also, see SALUTE, MILITARY AND NAVAL: V. to address with expressions of kind wishes and respect; to greet; to give a passing recognition to by a bow, etc.; to kiss; in the *army* and *navy*, to honor by a discharge of firearms, striking the colors, etc. SALU'TING, imp. SALU'TED, pp. SALUTATION, n. *săl'ū-tā'shŭn* [F.—L.]: a greeting; the act of paying respect or reverence in the usual style. SALUTER, n. *sa-lô'tėr*, one who salutes. SALUTATO'RIAN, n. *-ta-tō'rĭ-an*, the student of a college who pronounces the salutatory oration at the annual commencement. SALU'TATORY, *-ta-tėr-ĭ*, speaking a welcome; greeting: N. in the *United States*, the student's oration which introduces the exercises of a college commencement; in *OE.*, a place of greeting; a porch.

SALUTE', MILITARY and NAVAL: recognition of rank in the army and navy, when a royal personage, or high official, presents himself; a compliment when squadrons or armed bodies meet, when officers are buried, and on many other ceremonial occasions. There are several modes of saluting: firing great guns and small-arms, dipping colors, flags, and topsails, presenting arms, manning the yards, cheering, etc. A royal salute consists in the firing of 21 great guns; in the lowering by officers of their sword-points, and the dipping of the colors. The national U. S. salute is a gun fired for every state. For the pres. 21 guns are fired, vice-pres. 17; for cabinet officers, generals in command, and governors of states, 15; for major-generals and U. S. or foreign ambassadors, 13; for brig.generals, 11, etc.

SALUZZO, *sâ-lôt'sō*, or SALUCES, *sâ-lüss':* Episcopal city of n. Italy, in the province of Cuneo, at the foot of the Alps. It contains a semi-Gothic cathedral built 1480, with pillars of rare marbles, and colossal statues. Noteworthy are also the ancient civic palace, the old castle of the marquises of S. (now a prison), and a ruined abbey. S. was the birth-place of Silvio Pellico. Its products are grain, hemp, and wine; and its manufactures are silk fabrics and hats. Pop. commune (1881) 15,641; town about 10,000.

SALVABLE, a. *săl'va-bl* [L. *salvus*, safe, unharmed], that may be saved; admitting of salvation. SAL'VABLY, ad. *-blĭ*. SAL'VABIL'ITY, n. *-bĭl'ĭ-tĭ*, the possibility of being saved.

SALVADOR, *sâl·vâ-dōr'* : smallest, though one of the most densely populated of the Central American Republics (see AMERICA) ; consisting of a strip of territory 160 m. long between Honduras and the Pacific, bounded w. by Gautemala, and e. by Fonseca Bay, separating it from Nicaragua ; length e. to w. about 140 m., average breadth about 60 m.; 7,728 sq. m. with pop. of about 139 to the sq. m. The northern frontier is formed by a portion of the great Cordillera chain, and parallel to this range, and between it and the Pacific sea-board, runs another range of mountains along the whole length of the country, breaking it up into an inland valley, and a long low rich belt along the coast. This central range has 16 volcanic peaks, ranging in height from 7,386 to 4,000 ft. There are numerous lakes, the largest of which is Guija, about 90 m. in circumference, and abounding in fish. The greater portion of the interior valley, and the alluvial strip lying along the coast, are of extreme fertility, and agriculture is practiced, to the almost total exclusion of pastoral pursuits. The principal products have long been indigo, sugar, and maize, cotton also being successfully cultivated in districts around La Libertad and the Bay of Jiquilisco. Coffee is now the chief export ; of the imports the principal is cotton goods. The coast from Acajutla (30 m. from the w. frontier) to La Libertad is known as the *Costa del Balsamo*, or Balsam coast, as in the woods of this district is produced the famous 'Balsam of Peru,' in such quantities that 17,600 to 22,000 lbs. are annually exported. The mineral wealth is not very great, but rich veins of silver are found at Tabanco in the n.e., and mines of iron in the w. near Santa Ana. There is considerable export trade in Indigo (known in trade as 'indigo of Guatemala,' and reckoned the finest of all) and sugar, as well as turpentine, cocoa, cotton, and spices. Annual value of exports, about $10,950,000; imports, $6,500,000. The exports to the United States 1902-03 were $1,891,987; imports $797,-253; chief export, coffee, $1,305,894. The revenue 1901 was $6,556,722; expenditure $7,640,891. The debt 1899 was $3,197,960; foreign debt $3,552,193.

The climate generally salubrious, and the temperature is lower than might be expected from the low latitude and low elevation of the country. There is liability to volcanic disturbances, and earthquakes have wrought serious damage.

The bulk of the population is composed of Indians and mixed races, there being about three fifths of the former. There are about 9,000 whites (of Spanish origin), and 1,000 negroes. The Indians are of Aztec race, speak the Spanish language, and profess the Rom. Cath. religion (the one established by statute), but retain many of their old heathen rites, and live in some degree apart from the rest of the population. They have the rights of citizens, but generally exercise them under the advice of the govt. The govt. is administered by a pres., elected for 4 years, who appoints secretaries to take charge of the 4 departments—foreign relations ; justice and worship ; war, finance, and

interior; and public instruction. The legislature consists of an upper chamber of 12 senators, and a lower of 24 representatives. Education is provided for, every village of 50 inhabitants being bound by law to support a school, and there is a university in the capital, San Salvador. About 30,000 pupils are enrolled in the 585 primary, and higher schools. A railway connects Acajutla with Santa Anna and Labeiba, and since 1900 with San Salvador the capital, which also has railway connection with Santa Tecla, whence a line is projected to the port of La Libertad. There are over 120 m. of railroad in operation, 136 telegraph stations and 1,920 m. of telegraph wire, 63 telephone offices and 1,010 m. of telephone wire, and efficient postal service. About 450 vessels enter and clear Salvador ports annually, and since 1902 government subsidies have been granted prominent steamship lines, so as to stimulate maritime commerce. The standing army is 4,000 men; militia, 20,000; annual cost of the administration is about $8,500,000.

This country, originally *Cuscatlan*, 'the land of riches,' is said to have been, previous to the immigration of Europeans, the best peopled and most civilized country in America. It was conquered after a long and obstinate contest by Pedro de Alvarado, lieutenant of Cortes; and under Spanish rule was one of the most flourishing portions of the Guatemalan kingdom. In 1821 it threw off the yoke, and joined the Mexican Federation, from which, however, it seceded in 1823. The several trials since made of a union among the Central American states have ended in the dissolution of all political connection; so that Salvador is now an independent republic. In 1863 there was a war between Salvador and Guatemala, in which Honduras joined the former, and Nicaragua the latter. The result was the defeat of Salvador, and expulsion of the president from the country. In 1885 the president of Guatemala, Gen. Justo Rufino Barrios, made an effort to restore the old relations between the states in the northwestern part of Central America. He also failed. On Aug. 13, 1886, Salvador promulgated the constitution which is now in force. The most important single fact in the history of the little republic, as in that of Guatemala (q.v.), is the survival of the Indian element in undiminished force. Educated Salvadorians of the present day, when writing of the sufferings of the natives during the period of Spanish supremacy, unconsciously refer to the wrongs *sustained*, not *inflicted*, by their own ancestors. Consult Bancroft, *History of Central America;* Squier, *The States of Central America;* Ficklen, *Central America.*

On July 8, 1906, war broke out between Salvador and Nicaragua but it lasted less than a year, a treaty of peace being signed on April 23, 1907, at Amafala. Population in 1909, 1,100,000. See CENTRAL AMERICA.

SALVAGE, n. *săl'vāj* [OF *salvage*, salvage—from L. *salvus*, saved, preserved]: payment due by the owner of a ship or cargo to persons who may have been instrumental in saving it from extraordinary danger—from the sea, fire, or an enemy: the goods that have been saved. SAL'VOR, n. *-vėr*, one who is entitled to salvage. —*Salvage* was recognized in the earliest maritime codes—as in the laws of Rhodes, Oleron, and Wisby. By the law of England and of the United States, the amount of S. is to be determined by the court: and the court awards an amount generally much greater than would be mere compensation for the time and labor of the salvors; this as an inducement to others to render like services. The court takes into account the peril of the property, its value, the risks of the salvors, etc.; and decrees recompense accordingly. S. is not due for the saving of life only, unless it be the life of a slave. S. charges are assessable *pro rata* on all the goods saved. If an express agreement be made to pay a fixed sum whether the property in peril be saved or lost, the salvors cannot recover a larger amount. The distribution of S. among the salvors is usually made on this basis: $\frac{1}{3}$ (or more) to the owner of the salvor vessel; to the master twice as much as to mate; to the mate twice as much as to a seaman; to the salvor crew that takes a derelict into port twice as much as to their fellows who remain on the salvor vessel.

SALVATELLA, n. *săl'va-tĕl'la* [mid. L. *salvātus*, saved—from L. *salvus*, safe]: a vein in the arm terminating in the fingers, formerly regarded as having peculiar influence on the health when opened.

SALVATION, n. *săl-vā'shŭn* [F. *salvation*—from mid. L. *salvatiōnem*—from *salvātus*, saved—from L. *salvus*, saved: It. *salvazione:* Sp. *salvacion*]: preservation; deliverance from enemies; the redemption of man by Jesus Christ from sin and death, into holiness and the everlasting life.

SALVA'TION AR'MY: Christian organization, whose aim is to bring under the influence of the gospel the classes not reached by the ordinary agencies of the churches—the inhabitants of the lowest slums of cities, profligates, thieves, confirmed drunkards and vagabonds, as well as those who, though of worthy character, are in deep poverty. It was founded 1865 by William Booth (q.v.), now called 'General' Booth, formerly a minister of the Methodist New Connection. The organization steadily grew, and 1878 the name Salvation Army was adopted. Its members not merely fight figuratively under the Lord Jesus as the Captain of Salvation, but delight in applying pseudo-military terms to all their offices and actions. Thus the various local associations are 'corps,' and all the missionaries, male and female, are 'officers' (majors, captains, etc.); preliminary prayer is 'knee drill,' and public devotional services are 'skirmishes,' 'engagements,' or 'field-days.' The services are utterly unconventional; much use is made of

processions in the streets, of banners, and of brass bands in worship. Ejaculations of applause and wavings of handkerchiefs and flags accompanying the services. The doctrines are those of the evangelical churches, great stress being laid on purity of heart or santification. The army has excited singularly keen antipathy among the roughest part of the population, and its members have frequently been assaulted and maltreated, especially on occasion of processions. But they have undoubtedly been very successful in reclaiming drunkards and hopeless criminals, and their patient endurance and their active beneficence have at last gained them favor or at least tolerance among even the worst elements in the great cities of Britain. Their strange uncouth methods at first outraged the tasteful reverence of respectable church-members; but this by slow degrees gave place to a charitable endurance which in recent years has become a willing acceptance by them by the churches as a valuable help of the gospel in the field which they have chosen.—See BOOTH, WILLIAM. The headquarters of The Salvation Army in America are at 120 W. 14th Street, New York. Commander Booth Tucker is in charge of the work. The first party of officers, under Commissioner George Railton, landed in New York in 1881, Feb. The work has made rapid progress, especially during the last few years, for which the figures stand as follows: Institution, etc.—Officers and employees (1896) 2,000; (1903) 3,171 increase 1,171. Corps and institutions (1896) 620; (1903) 900; increase 280. Institutions for the poor (1896) 30; (1903) 209; increase 179. Accommodation in same (1896) 600; (1903) 9,560; increase 8,960. Expended annually in poor relief (1896) $20,000; (1903) $800,000; increase $780,000. Persons provided with Thanksgiving and Christmas free dinners (1903) 300,000; increase 300,000. In 1896 Commander Ballington Booth was ordered to a foreign command, but believing it his duty not to leave America, after protracted conference he severed his connection with the S. A., and organized a new society. See VOLUNTEERS, AMERICAN.

SALVE, n. *sâv* [Goth. *salbon;* Ger. *salven,* to anoint: A S. *scalf;* Ger. *salbe,* salve: comp. Gael. *sàbh,* ointment]: an ointment for healing: V. to heal by external application of ointment; to flatter; to wheedle; to help with an excuse. SALV'ING, imp. SALVED, pp. *sâvd.*

SALVE, v. *sălv* [L. *salvus,* safe]: to save a ship or goods from danger of any kind; to save goods from fire. SALV'ING, imp. SALVED, pp. *sălvd.* See SALVAGE.

SALVE, v. *sălv* [L. *salvĕ,* hail!]: in *OE.,* to salute.

SALVELI'NI: see CHARR.

SALVER, n. *săl'vĕr* [Sp. *salva* or *salvilla,* originally the tasting of meat at a great man's table, then a salver—from *salvar,* to taste, to prove food—from L. *salvus,* safe]: a plate or tray on which anything is presented. SALVER-SHAPED, a. in *bot.,* same as *hypocrateriform* (q.v.).

SALVIA.

SALVE REGINA, *săl'vē rē-jī'nâ:* first words of one of the most popular hymns in the Rom. Cath. Church, addressed to the Blessed Virgin Mary. It forms part of the daily office of the Breviary, and is recited at the end of 'Lauds' and of 'Compline.' But it is still more in use as a hymn of private devotion, and concludes with an earnest and tender appeal for the intercession of the Blessed Virgin with her Son, 'that we may be made worthy of the promises of Christ.'

SALVIA n. *săl'vĭ-a* [L. *salvĭa*, the herb sage—from *salvus*, safe, well]: a genus of plants, several species of which are garden plants, distinguished by their lipped calyx and very long connectives, ord. *Labĭātæ*: see SAGE.

SALVINI, *sâl-vē'nē*, TOMMASO: Italian actor: b. Milan, Italy, 1830, Jan. 1. He inherited his art from his parents, and entered early on the stage. At 19 years of age, he participated in the anti-Austrian and republican revolution. Besides the principal rôle in many Italian and French plays, he performed with great ability the parts of Othello, Romeo, Hamlet, etc., and ranked with the masters of tragedy. In 1873–4, he gave many performances in the principal cities of the United States, and again in 1881 and 1889.

SALVO, n. *săl'vō* [It. *salva*, a salute of firearms]: military salute, as a *salvo of artillery.*—S. is also a concentrated fire from a greater or less number of pieces of artillery. Against a body of men, a S. is generally useless, as the moral effect is greater in proportion to the area over which devastation is spread; but with fortifications, the case is otherwise. For the purpose of breaching, the simultaneous concussion of a number of cannon-balls on masonry, or even earth-work, produces a very destructive result. At Almeida, after the French had fired a few salvos of 65 guns, the castle sank in a shapeless mass. The effect of a S. of modern artillery, with its enormous steel shot, against iron-plated ramparts, has never yet been tried in actual war.

SALVO, n. *săl'vō* [contracted from L. *salvo jure*, saving the right—an expression used in reserving rights]: an exception; a reservation.

SAL VOLATILE: see under SAL.

SALVOR: see under SALVAGE.

SALZBRUNN, *sâlts'brûn*: name of three villages, NEU, *noy*, NIEDER, *nē'dĕr*, and OBER, *ō'bĕr*, S.; in Prussian Silesia, 37 m. s. w. of Breslau. They have eight mineral springs and baths, visited annually by about 4,000 pulmonary patients. Alkalo-saline water is exported. Pop. 6,000.

SALZBURG, *sâlts'bûrch* : a crown-land in w. Austria, bounded w. partly by Bavaria, partly by the Tyrol; 2,765 sq. m. The principal mountain-ranges are the Noric Alps, which traverse the south of S. from w. to. e., and in the Grossglockner rise 12,360 ft.; and branches of the Rhætian Alps, which separate the Tyrol from S., and ramify throughout the middle districts of the latter, rising in the Ewiger Schneeberg 9,580 ft. Snow-fields and glaciers occur in the more elevated regions. The chief river, the Salza, draining the greater part of the crown-land, flows first e., then n., and is 147 m. in length. The climate is cold and variable, but healthy, and though, of the whole area, 2,000 sq. m. are capable of bearing crops, this crown-land is inferior to most of the provinces of the monarchy in quantity and value of products. The rearing of cattle and horses is an important industry. Salt is obtained in large quantities, especially at Halle (q.v.). Salzburg (q.v.) is the capital. Pop. of crown-land (1880) 163,566, nearly all Rom. Cath., and of German stock; (1890) 173,510; (1900) 810,346.

SALZ'BURG (anc. *Juvavia*): the most charmingly situated town in Austria or Germany; it is cap. of the Austrian crown-land of S. It is on both banks, but chiefly on the left bank of the Salza, 190 m. w.s.w. of Vienna by railway, 87 m. s.e. of Munich. Here the river, banked on both sides by precipitous crags, rushes through what seems a natural gateway, and flows to its junction with the Inn. The picturesque situation of the city has elicited the admiration of many travellers. The town is of anc. ecclesiastical origin, and is full of objects of interest. The heights on either bank of the Salza are crowned with edifices. That on the left, Mönchsberg (1,732 ft.), is surmounted by the castle Hohen-Salzburg, an irregular feudal citadel of the 11th c., and, during the middle ages, the residence of the archbishops of S,, who combined the dignity of princes of the German empire with their ecclesiastical rank. The castle, dismantled, is now a barrack. A statue of Mozart (q.v.) adorns one of the squares. Opposite Mönchsberg is the Capuzinerberg (2,132 ft.) with a convent. The cathedral, a large and beautiful Italian edifice, was built early in the 17th c. The architectural taste of the prince-archbishops has adorned the city with many beautiful edifices, chiefly in the Italian style. The city is surrounded by walls, here and there dismantled, and the bastions are mostly in decay. The city is the seat of an abp., and contains numerous libraries, museums, and educational and other institutions, among which is an upper gymnasium, and the *Mozarteum*. It has some manufactures, is in communication with Vienna, Munich, and Innspruck by railway, and has considerable transit-trade. Pop. (1890) 27,741; (1900) 33,067.

SALZKAMMERGUT, *sâlts-kâm'mėr-gôt,* called also the AUSTRIAN SWITZERLAND: one of the most picturesque districts of Europe; forming the s.w. angle of Austria ob der Enns, between the crown-land of Salzburg on the w. and Styria on the e.; 249 sq.m. The scenery combines in rare beauty the usual features of valley, mountain, and lake. The vales are clothed with rich verdure and studded with clumps of fruit and forest trees; the mountains are covered with beeches and oaks; higher up with pines and larches; and some are topped with everlasting snow. The highest peak, the Dachstein, rises 9,846 ft. But the district derives its reputation for beauty chiefly from its lakes, the largest and most famous of which are the Hallstadt and the Traun, or Gmunden lakes. They are bordered with lofty mountains, which rise sheer from the water; and their pit-like character, and the strong light and shade thrown on them from the mountains, combine to render the scenery, of which they form the centre, unusually sublime. The Hallstadt and Traun lakes are connected, and indeed formed, by the river Traun. The district is a favorite resort for tourists. It takes its name from the salt obtained in enormous quantities from its springs and mines. Salt being a government monopoly in Austria, the works are under the management of the *Kammer,* or exchequer. From 6,000 to 7,000 of the inhabitants are employed in the salt-works, and the amount annually obtained is nearly 50,000 tons. The chief seats of the salt-works are Ischl and Hallstadt. There is little agriculture in the Salzkammergut and the inhabitants not employed in the salt-works are engaged in cattle-breeding and in the timber trade. Pop. about 18,000, of whom 6,500 are Protestants.

SAM, or SAME, ad. *sām* [see SAME]: in *OE.*, together.

SAMAL: an island in the Philippines in the n. part of Davao Bay, forming the e. shore of Pasiputan Strait, length 17 m., width 13 m., area 140 sq.m. Its general elevation is 820 ft., some parts of the shores are low and wooded, and other portions are high and rocky. The soil is fertile, and chocolate is the chief product; excellent timber is also obtained. The island is well populated, having seven small towns on its w. coast.

SAMALES: (1) a small tribe of the Philippine Islands, living on the island of Samal in the Gulf of Davâo, on the e. coast of the island of Mindanao. They are of the Malay race. (2) The name sometimes given to the Moros inhabiting the islands between Basilan and Sulu, Philippines; they are also called Sámales-Laût.

SAMANA BAY: an indentation of the e. coast of Santo Domingo, Haiti, 30 m. long and 10 m. wide. It affords an excellent harbor, being well sheltered and deep, capable of accommodating the largest vessels. The ports of Sanchez and Santa Barbara de Samana are on

the n. coast. The bay has an important position near the route from the United States to the Isthmus of Panama.

SAMANI, *sâ-mâ'nē,* AND DILEMI, *dĭ'lė-mĭ:* two dynasties which divided between them the kingdom of Persia toward the beginning of the 10th century. They both rose to power through the favor of the caliphs, but they speedily threw off the yoke. The Dilemi, divided into two branches, exercised sovereign authority in Kerman, Irak, Fars, Khuristan, and Laristan, always acknowledging their nominal dependence on the caliph; but Mahmud of Ghizzi put an end to the rule of the northern branch 1029, and the Seljuks subjugated the southern 1056. The *Samani* had obtained from the caliph the government of Transoxiana 874; and to this, Ismail, the most celebrated prince of the family, speedily added Khaurezm, Balkh, Khorassan, Seistan, and many portions of n. Turkestan. Rebellions of provincial governors distracted the Samanide monarchy toward the end of the 10th century; and their dominions n. of Persia were taken possession of by the khan of Kashgar.

SAMAR, n. *sā'mâr,* or SAMARA, n. *săm'a-ra* [L. *samara, samera,* the seed of the elm]: in *bot.,* a compressed, few-seeded, coriaceous or membranous, indehiscent pericarp, with a membranous expansion or wing at the end or edges, as in the ash, maple, and elm, and called key-fruit. SAM'AROID, a. *-oyd* [Gr. *eidos,* appearance]: resembling a samara.

SAMAR: an island of the Philippines, the third in size of the archipelago. It lies s.e. of Luzon, in the extreme n.e. part of the Visayan group, and e. of Leyte, from which it is separated by the narrow strait of San Juanico; length n.w. and s.e. 156 m.; width 75 m.; area 5,198 sq.m., with dependent islands 5,488 sq.m.

SAMARA, *sâ-mâ-râ:* frontier government of s.e. Russia, bounded e. by the Kirghiz Steppes, and w. by the governments of Saratov, Simbirsk, and Kazan; 58,320 sq.m. It was erected into a government by ukase 1850, Dec., and was formed out of portions of the governments of Simbirsk, Orenburg, and Saratov. The Volga, which forms the w. boundary, and its affluent, the Samara, are the chief rivers. The country is very fertile; and agriculture and fishing are among the chief employments of the inhabitants. Pop. 2,763,500.

SAMARA': town, cap. of the Russian government of Samara, on the left bank of the Volga, at the junction of that river with the Samara. It is the chief grain-market on the Volga, and contains numerous store-houses, especially for grain. A good trade in salt, fish, caviare, and tallow is carried on. Business and population are increasing. From Samara are brought a great number of lambs' skins, famous for their fineness. Pop. 91,700.

SAMARANG, *sâ-mâ-râng':* important seaport on the n. of Java, 385 m. (by steamboat course) e. of Batavia; 6° 57′ 20″ s. lat., 110° 26′ 30″ e. long; cap. of the residency, under Dutch control, and the point to which the produce of Middle Java is brought for export. The city lies on the right bank of the river Samarang. A railway to the Vorstenlanden (Princes' Lands), 126 m. long, was completed 1874. The Chinese, Malays, and Arabians have their own captains, and quarters of small, dark, dirty houses. The Europeans dwell partly along the sea-shore, but chiefly on the left of the river, by the shady road to Bodjong, the resident's house, which is two miles from the city. The Protestants and Rom. Catholics have each a church, orphan-house, and school. There are several public and private schools, an excellent hospital for 550 patients, and other charitable institutions.

Only small vessels can enter the river. The roadstead is exposed to the w. wind, and is dangerous during the rainy season. Besides the usual trades, the natives work in gold, silver, copper, and tin. Coffee, rice, sugar, tobacco, and indigo are chief exports, an agent of the Netherlands Trading Company (q.v.) being established at S. to attend to the govt. trade.—Pop. of the residency of S. about 1,300,000, 4,000 being Europeans, and 15,000 Chinese. Pop. of city 80,000.

SAMARIA, *sa-mā'rĭ-a* (Heb. *Shomerôn*, Chald. *Shamrayin*, Septuagint, *Samareia*, *Semerōn*, etc.): anciently a city of Palestine, chief seat of the Ephraimitic Baal-worship, and, from the seventh year of Omri's reign, cap. of the kingdom of Israel. It was beautifully situated on a hill about 6 m. n.w. of Shechem, and may have derived its name (which may be interpreted 'pertaining to a watch' or a 'watch-mountain') from the position of the hill, which rises about 1,470 ft. above sea-level from the centre of a wide valley, and commands an extensive prospect; but an eponymous etymology is adopted by the writer of I Kings, who says (xvi. 24): 'And he [Omri] bought the hill Samaria of Shemer for two talents of silver, and built on the hill, and called the name of the city which he built, after the name of Shemer, owner of the hill, Samaria.' The date assigned to Omri's purchase is B.C. 925, from which time S. became the seat of govt., which had been at Thirsa. It was twice besieged by the Syrians, B.C. 901 and B.C. 892, under Ahab and Joram, on both occasions unsuccessfully; but B.C. 721 (720), it was stormed by Shalmaneser, King of Assyria, after three years' siege. Its inhabitants, together with those of all the other 'cities of Samaria' (which had become the general name for the country itself in which the city stood), i.e., the kingdom of Israel —or the 'ten tribes'—were then carried off into a captivity from which they never returned. These were the ten 'lost tribes of Israel.' Their place was supplied, after a time, by colonists, planted there by Shalmaneser

and Esarhaddon, from Babylon, Cuthah, Ava, Hamath, and Sepharvaim (according to II Kings, xvii. 24; Media and Persia, Josephus's *Antiquities*, x. 9, 7), who constituted the original body of the people subsequently known as Samaritans, but whose bulk was gradually increased by accessions of renegad Jews and others. The question has been much, and on the whole unprofitably, discussed, whether these so-called 'Samaritans' were a mixed race of remanent Israelites and heathen Assyrians, or whether they were exclusively the latter The mere language of Scripture, strictly construed, seems to favor the second of these views, unless the term 'cities,' II Kings, xvii. 24, is intended to imply that the ancient inhabitants dwelt in the open country. On the other hand, we find, apart from the other reasons against so unparalleled a wholesale deportation, Israelitish inhabitants under Hezekiah and Josiah, both in Ephraim and Manasseh. Modern authorities therefore assume that they were, to a certain extent, what they alway insisted on being, Israelites—(not Jews), i.e., a people largely intermixed with Israelitish elements, that, during the exile, had adopted the worship of Jehovah. The returning Jews, however, would not recognize their claims to participation in the national *cultus* and temple, and a bitter antagonism sprang up between the two nationalities. B.C. 409 a rival temple was erected on Mount Gerizim, and a rival priesthood and ritual organized; and thenceforth the breach, fo. some periods at least, became apparently irreparable—'the Jews had no dealings with the Samaritans,' and *vice versâ*. At other periods, however, a more friendly intercourse seems to have subsisted. The rabbinical laws respecting the 'Kushites' (Cuthim), as they were called by the later Jews, are therefore strangely contradictory, and their discrepancies can be explained only in part by the ever-shifting phases of their mutual relations, and in part by the modifications which occurred in the Samaritan creed itself. The later history of the city of S. is somewhat checkered. It was captured by Alexander the Great, when the 'Samaritan' inhabitants were driven out, and their place supplied by Syro-Macedonians. It was again taken B.C 109 by John Hyrcanus, who completely destroyed it. Soon rebuilt, it remained for the next 50 years in possession of the Jews; but Pompey, in his victorious march, restored it to the descendants of the expelled Samaritans who had settled in the neighborhood, and it was refortified by Gabinius. Herod the Great rebuilt it with considerable splendor, and called it Sebaste, in honor of Emperor Augustus, from whom he had received it as a present. In the 3d c., it became a Roman colony and an episcopal see. Its prosperity perished with the Mohammedan conquest of Palestine; and at present it is only a small village called Sebustieh—Arab corruption of Sebaste—but contains a few relics of its former greatness. 'Samaritans,' as a religious sect, still exist at Nablus (anc. Shechem),

as they have existed in the district uninterruptedly through all vicissitudes of war and conquest since the time of Christ. Their present creed and form of worship agree in many particulars with that of the so-called 'rabbinical' Jews, although the Samaritans pretend utterly to reject the 'Traditions.' They alone, however, have retained the paschal sacrifice of a lamb.

SAMARITAN LANGUAGE.—This language has by some scholars been regarded as a mixture of Aramaic and Hebrew, but now it is regarded as a pure dialect of w. Aramaic. The earlier opinion was based on data supported by the Samaritan Pentateuch (q.v), which is a translation not very skillfully executed from the Hebrew. An attempt is plainly seen to embellish the language of the translation by introducing forms borrowed from the Hebrew original; and the introduction of Hebrew and even Arabic words and forms was practiced in Samaria on a still larger scale by copyists who lived after Aramaic had become a dead language: see ARAMÆA. The Samaritan language remains only in a few fragments of ancient literature, a translation of the Pentateuch, and some liturgical pieces. The present inhabitants speak Arabic.—See Dr. Robinson's *Biblical Researches*, Raumer's *Palästina*, and Dean Stanley's *Sinai and Palestine*, etc.

SAMARITAN, n. *să-măr'ĭ-tan:* an inhabitant of *Samaria;* a descendant of the foreign race placed in Samaria after the captivity of Israel; the language of Samaria: ADJ. denoting the ancient characters used by the Hebrews before the Babylonish captivity, and thereafter in the language of the Samaritans. GOOD SAMARITAN, a charitable or benevolent person—in allusion to the character of the 'good Samaritan' in the parable.

SAMAR'ITAN PENTATEUCH: recension of the commonly received Hebrew text of the Mosaic law, in use with the Samaritans, and to them the only canonical book of the Old Test. Some vague allusions in some of the Church Fathers (Origen, Jerome, Eusebius) and one or two more distinct, but less generally known, Talmudical utterances respecting this recension were all the information available till the early part of the 17th c. (1616), when Pietro della Valle acquired a complete codex from the Samaritans in Damascus. Since then, the number of MSS. of the S. P., with and without translations (in Arabic), has considerably increased in European libraries; and fragments, consisting of special books or chapters, are frequent. In fact, writing portions of S. P. on the oldest of skins, seems—in view of the great demand for the article on the part of ignorant European, especially English, travellers—a favorite and lucrative pastime, if not an established trade, among the modern Samaritans.

These MSS. are in the Samaritan character, a kind of ancient Hebrew writing, probably in use before and partly after the Babylonish exile; and they vary in size

from octavo to folio, the writing being proportionately smaller or larger. Their material is vellum, or cotton paper, and the ink is black, except the Nablûs MS. in gold. There are neither vowels, accents, nor diacritical points, the single words are divided from each other by dots. None of the MSS. that have reached Europe are older than the 10th c. The S. P. was edited first by J. Morinus in the Paris *Polyglott* (pt. iv. 1632) from *one* codex (whence it found its way into Walton), and was re-edited, written in the square Hebrew character, last by B. Blayney, Oxford, 1790. The first publication of this strange document, and principally the *Exercitationes Ecclesiasticæ*, with which J. Morinus accompanied it, mark a certain epoch in modern biblical investigation; for, incredible as it now appears, it was placed by Morinus and his followers far above the received Hebrew text, which was said to have been corrupted from it. As reasons for this, were adduced its supposed superior 'lucidity and harmony,' and its agreement with the Septuagint in many places. This opinion, which could have been entertained only by men devoid of knowledge, was both zealously cherished and fiercely combated for exactly 200 years, when the first proper and scientific investigation (by Gesenius) set it at rest, once for all, among the learned world. This absurd notion owed its popularity chiefly to the anti-Jewish as well as anti-Protestant tendency of its supporters, to whom every attack against the received form of the text—that text on which alone the Reformers professed to take their stand—was an argument in favor of the Rom. Cath. dogma as to the 'Rule of Faith' (q.v.). This boasted superiority *en bloc* gradually dwindled down to two or three passages, in which the Samaritan reading seemed preferable; and even these have now been disposed of in favor of the authorized Masoretic text. The variants, which Gesenius was the first to arrange systematically, present simply the ordinary aspect of partly conscious, partly unconscious corruptions. They arose, for the greatest part, from imperfect knowledge of the elements of grammar and exegesis. Others owe their existence to a studied design of conforming certain passages to the Samaritan mode of thought, speech, and faith, especially to show that Mount Gerizim was the spot chosen by Jehovah for his temple. There are, however, only two essential alterations respecting the Mosaic ordinances themselves to be found, one, Exod. xiii. 7, where the S. P. has 'six days shalt thou eat unleavened bread,' instead of 'seven;' and Deut. xxiii. 17, where our 'shall be no' is altered into 'shall not live.' A chronological peculiarity deserves special mention—viz., that no one in the antediluvian times begets his first son in the S. P., after the age of 150 years, either the father's or the son's age being altered in proportion; after the Deluge, however, the opposite method is followed of adding 50 or 100 years to the father's years before the begetting of a son. We add

only that anthropomorphisms, as well as anthropopathisms, are carefully expunged, and that in Deut xxvii. 4, Gerizim is wilfully substituted for Ebal.

In the absence of a critical edition, it is exceedingly difficult to do more than speculate on the age and origin of the Samaritan Pentateuch, and opinions remain widely divergent. The principal opinions on the subject are, briefly, either that it came into the hands of the Samaritans as a natural inheritance from the Jewish people, whom they succeeded at the time of the Babylonian exile; or that it was brought to them by the Manasse (Jos. *Ant.* xi. 8, s. 2, 4), when the Samaritan sanctuary on Mt. Gerizim was founded; or, again, that the Israelitish priest sent by the king of Assyria to instruct the new settlers in the religion of the country, brought it with him. Of other more or less isolated opinions, only one deserves further notice, that it was a late and faulty recension, into which glosses from the LXX. (Septuagint) were received. This agreement, above alluded to, between the LXX. and the Samaritan Pentateuch likewise has given rise to many speculations and suggestions. The foremost of these are, that the LXX. have translated from the Samaritan Pentateuch; that mutual interpolations have taken place; that both versions were formed from Hebrew codices, differing among themselves, as well as from the authorized recension; and that many wilful corruptions have been superadded at a later time; finally, that the Samaritan has been altered from the LXX. There is also a translation of the Samaritan Pentateuch (which is Hebrew) into the Samaritan idiom; it is ascribed by the Samaritans to their high-priest, Nathaniel, who died B.C. 20. It was probably a kind of popular version, like the Targums; and was composed, very likely, shortly before the destruction of the second temple. The translation is done in a slavish and incompetent manner. There is a fairly large Samaritan literature, the Samaritan vernacular giving way to the Arabic after the conquest of Syria (632), and ceasing to be popularly understood by the 10th to the 11th century. Apart from the Samaritan version of Paul, the Targum, the Sam, Arabic version, the literature consists largely of commentaries, liturgies, chronicles, and grammars.

SAMARKAND, *sâ-mâr-kând'*: city, cap. of the great Tartar empire of Timur, centre of Mohammedan learning in central Asia; till 1868 the second city of the khanate of Bokhara; and since its annexation to the dominions of the czar one of the chief towns of Russian Turkestan. It is in lat. 40° 2′ n., and long. 67° 3′ e., 4 English m. s. of the Zer-Afshan (a river which 'loses itself in the sands'), and 145 m. nearly e. by n. from Bokhara. It is at the foot of Mt. Chobanata, in a plain of exuberant fertility; and from a distance, its glittering minarets, lofty domes, and prominent edifices and ruins,

relieved by the brilliant green of the closely-planted gardens interspersed within the walls, present an imposing effect. The river for centuries has been changing its course, and Samarkand has followed it—so that it consists of a 'new city,' and the ruins of those which preceded it. The 'new city' is surrounded with walls, pierced with six gates, and is filled with narrow streets and lanes; but has been much improved by the Russians. The population, which in the 14th c. exceeded 100,000, and in 1834 had dwindled to 8,000, has since 1880 risen to 35,000. The inhabitants are chiefly Tajiks and Usbeks, and employed in manufacture of silk, wool, and leather. The old or 'ruined city' is the portion most interesting to Europeans, as the capital of Timur, the great conqueror who wielded the scepter of Asia from China to the Hellespont. Many of the ruins belong to this epoch, among which are the Hazreti Shah Zinde, formerly supposed to have been a summer palace of Timur, but now shown to have consisted of tombs and chapels only. In the center of the city, separated from one another by a wide open space, stand three medresses, or sacred colleges. One of the objects of interest in Samarkand is the palace of the Emirs of Bokhara, within the citadel, where, before the Russian conquest, they were in the habit of spending the summer months with their harem suite. Samarkand was the ancient *Maracanda*, capital of Sogdiana. It was seized by the Arabs 707, and from this time belonged either to the caliphate or to some of the dynasties which were offshoots from it, till 1219, when it was taken by Genghis Khan. In 1359 it was captured by Timur, and ten years afterward became the capital of his empire. It remained the chief town of Turkestan till 1468, when it declined in importance with the rise of the Usbeks, but retained its place as the chief seat of Mohammedan learning in Asia. Until recently it had been visited by only four Europeans—1404 by the Spaniard Clavijo, 1841 by Lehmann and Chanykow, and 1863 by Vambery. But 1868, May, the gates were opened to the Russians.

SAMAVEDA, *sâ-ma-vē'da:* one of the four Vedas. See VEDA.

SAMBAS'. See PONTIANAK.

SAMBATION: the name of a river appearing in rabbinical literature as the stream across which the ten tribes were transported by Shalmaneser, the king of Assyria, after his conquest of Israel. It is called by some a river in Media, by others, in Palestine, as a stream ceasing periodically every seventh day, a peculiarity exaggerated by legend which has blended the Sambation of the ten tribes and the Sabbatic river of Media or Palestine. The idea has been seized upon by imaginative writers and travelers, some of whom have marvelous tales to tell about the qualities of the sand of the river, even when kept in a glass. Its position has

been variously placed in Ethiopia, in upper India or near the Caspian Sea, while modern critics, who doubt the legend, identify the river with the Euphrates, or the Zab in Adiabene. Sir John Mandeville, in the ninth chapter of his book of travels (1322-1356) writes: 'Between the city of Dark and the city of Raphane is a river which they call Sabatorye; for on the Saturday it runs fast and all the week it standeth still, and runs naught or little.'

SAMBO, n. *săm'bō* [Sp. *Zambo*]: the offspring of a negro and a mulatto; a familiar name for one of the negro race.

SAM'BOO, or SAM'BUR. See RUSA.

SAMBU'CUS. See ELDER.

SAMBUKE, n. *săm'būk* [L. *sambuca*—from Gr. *sambukē*]: an ancient musical instrument; though applied sometimes to several musical instruments of different kinds, such as a lyre, a dulcimer, a triangular harp or trigon, and often to a large Asiatic harp.

SAME, a. *sām* [Goth. *sama,* same; *samana,* together: Slav. *sam;* Russ. *samüi,* self: L. *simul;* Gr. *hama,* together: Skr. *sama,* alike, equal]: not different or other; identical; equal; that was mentioned before. SAME'NESS, n. *-nĕs,* near resemblance; similarity.

SAMIAN, a. *sā'mĭ-an:* from the isle of Samos. The SAMIAN SAGE, Pythagoras, born in Samos. SAMIAN LETTER, a letter formed of a stem bifurcating thus Y, employed by Pythagoras to symbolize the straight narrow path of virtue which, once departed from, rapidly fades from the sinner's sight: also PYTHAGOREAN LETTER.

SAMIEL, n. *sā'mĭ-ĕl* [Turk. *sam-yeli*—from Ar. *samm,* poison, and Turk. *yel,* wind]: the hot poisonous wind which often blows in Arabia; also called the *simoom.*

SAMITE, n. *săm'īt* [OF. *samit,* a silk stuff—from mid. L. *examitum,* a silk stuff—from Gr. *her,* six; *mitos,* the thread of a web]: in *OE.,* a silk stuff; velvet; satin.

SAMLET. See under SALMON.

SAMMATIYA: one of the four divisions of the *Vaibhâshika* system of Buddhism: its reputed founder was *Upâli,* disciple of *the* Buddha; S'âkamuni.

SAMNITES, *săm'nīts:* ancient Italian people of Sabine origin, who occupied an extensive and mountainous region of s. Italy. They were surrounded on the n. by the Peligni, Marsi, and Marrucini; on the w. and s.w. by the Latins, Volscians, Sidicini, and Campanians; on the s. by the Lucanians; and on the e. by the Apulians and Frentani. The Samnites were divided into four nations: 1. The *Caraceni* in the n., whose capital was Aufidena. 2. The *Pentri* in the center, whose capital was Bovianum, the most powerful nation of the Samnite stock. 3. The *Caudini* in the s.w. 4. The Hirpini in the s., capital Beneventum. For account of their origin, ethnological affinities, and history, see ROME (*History*).

SAMOA.

SAMOA, *sâ-mō'â*, or SAMOAN ISLANDS, or NAVIGATORS' ISLANDS: group of islands, with some islets, in the Pacific Ocean, 420 m. n.e. of the Fiji Islands; lat. 13° 30′—14° 20′ s., and long. 169°—173° w. The three principal islands of the group are Sawaii (Pola), Upolu (Oyalava), and Tutuila (Mauna); of these, Sawaii, 40 m. long by 20 m. broad (pop. 13,201), is the largest. The area of the group is estimated 1,200-1,500 sq.m.; pop. (1872) 35,000; (1900) 38,412. These islands except one (Rose Island) are all of volcanic origin. For the most part they are lofty, and broken and rugged in appearance, rising in some cases more than 2,500 ft., and covered with the richest vegetation. The soil, formed chiefly by the decomposition of volcanic rock, is rich, and the climate is moist. The forests, which include the bread-fruit, the cocoa-nut, banana, and palm trees, are remarkably thick. The orange, lemon, tacca (from which a kind of sago is made), coffee, sweet potatoes, pineapples, yams, nutmeg, wild sugar-cane, and many other important plants, grow luxuriantly. Until recently, when swine, horned cattle, and horses were introduced, there were no traces among these islands of any native mammalia except a species of bat. The natives are well formed (especially the men), ingenious, and affectionate. The women, who superintend the indoor work and manufacture mats, are held in high respect. English and American missionaries have had much success here, and many of the natives have embraced Christianity; indeed all on Upolu are nominally Christian; but some of the firmer elements of character have not yet had time for development. In March, 1889, a terrific hurricane swept over the islands, and a great naval disaster was recorded. Rear Admiral Kimberley, of the United States navy, with his flag hoisted on the Trenton, had arrived early in March and besides the flagship his squadron included the Vandalia and the Nipsic. The German men-of-war at Apia were the Adler, the Eber and the Olga, while Great Britain was represented by the Calliope. On the afternoon of March 15 came the first indication of the hurricane. Late in the day the storm broke with terrific fury. Increasing in violence, by midnight it was a raging gale and by morning a howling tempest. The next morning several of the smaller ships broke loose from their fastenings and either collided with each other or were dashed to pieces on the jagged reefs. The first of the men-of-war to succumb to the storm was the little German gunboat Eber. Colliding sharply with the Nipsic, with a force that almost sent both of them to the bottom, she smashed head on to the reef and almost insantly sank with a loss of 71 lives. The Adler followed with a loss of 20 lives. The Vandalia was wrecked and her commander, four officers and 39 men were drowned. The Olga and the Nipsic were beached and the Trenton wrecked.

SAMOA.

In 1889 a conference between the representatives of the American, British, and German governments, was held at Berlin, at which a treaty was signed by the three powers guaranteeing the neutrality of the islands in which the citizens of the three signatory powers would have equal rights of residence, trade, and personal protection. They agreed to recognize the independence of the Samoan government and the free rights of the natives to elect their chief or king and choose a form of government according to their own laws and customs. A supreme court was established, consisting of one judge styled the Chief Justice of Samoa. To this court were referred: First, all civil suits concerning real property situated in Samoa; second, all civil suits between natives and foreigners or between foreigners of different nationalities; third, all crimes committed by natives against foreigners or committed by such foreigners as are not subject to any consular jurisdiction. The capital was located at Apia. A commission was appointed to investigate titles to land alleged to have been purchased from the natives, and this in 1894 completed its labors. confirming about 75,000 acres of land to Germany, 36,000 to British, and 21,000 to Americans.

The chief advantage obtained by the United States in this agreement is that the island of Tutuila contains the harbor of Pango-Pango, one of the finest in the South Pacific, which cuts the island nearly in two. Tutuila is 17 m. long by 5 broad. The United States gave no *quid pro quo* for the Island of Tutuila either to Germany or Great Britain; but Germany surrendered a large amount of territory and other important rights to Great Britain in return for the latter's surrender of rights in Samoa. Germany gave up the portion of the Solomon group which she owned, and consented to a division of the neutral zone in West Africa, giving to Great Britain the territory about the mouth of the Volta river, which British diplomatists long tried in vain to obtain. On Jan. 12, 1900, Malietoa addressed a protest to the governments of the United States, Great Britain and Germany against the Samoan treaties. He characterized the partition of Samoa as a gross violation of the treaties and as a crime against the law of nations, only equal to the dismemberment of Poland, Denmark, and France. During the Boer war in South Africa, Great Britain surrendered her remaining rights in Samoa to Germany, which country, with the United States, possessed the islands in 1903.

Government.—Germany governs Savaii and Upolu and the adjacent islets, and the United States, Tutuila and the Manua group. German Samoa is administered by an imperial governor, and a native chief, assisted by a native council. The American possessions are in charge of a naval governor.

Population.—The aggregate population of the islands

in 1903 was about 38,000, of which something over 200 were British subjects, 300 Germans, 100 Americans, 25 French, and 25 of other nationalities, while the remainder were natives of the Polynesian race. The bulk of the population was located in the three principal islands, the number in Upolu being 16,600, in Savaii 14,000, and in Tutuila 4,500.

SAMOS, *sā'mŏs*, now SAMO, or SOUSAM-ADASSI: an island in the Ægean Sea belonging to the Grecian Archipelago. It is 45 m. s.w. of Smyrna, and is separated from the coast of Asia Minor by a narrow channel, Little Boghaz, and from Nikaria and the Furni Islands by the Great Boghaz. It covers an area of 213 sq.m. and has several good harbors on the coast; it is traversed by two rocky and barren mountain ranges, relieved by some forests of pines, with vineyards and olive groves on the lower slopes. The valleys are well-watered and fertile, and contain beautiful scenery. Samos is tributary to Turkey to the extent of paying an annual stipend to the sultan, but is otherwise governed by a Greek prince nominated by the Porte. The capital and chief city is Vathy, on the n. side. The old capital, Khora, is a poor place on the s. side. This was the site of the famous temple of Hera. The island is extensively cultivated, produces excellent Muscadine wine, corn, fruit, and vegetables. The minerals include silver, lead, antimony, calamine, manganese, and copper. Samos is renowned as the birthplace of Pythagoras and other distinguished men. It was formerly inhabited by Ionian Greeks. The chief exports are wine, brandy, raisins, hides, leather, oil, tobacco, and carob-beans. Pop. (1900) 54,830.

SAMOSATENES, or SAMOSATIANS: a heretical sect, followers of Paul of Samosata, bishop of Antioch, from 260 to 274 A.D. He denied the divinity of Jesus Christ, saying Jesus was simply man, though favored with the indwelling of the Logos from the instant of his conception: by the unvarying conformity of his will to the Divine will, he became like unto God, and through love he became one with him. His doctrine was condemned as impious by three councils of bishops, the third of which by decree deposed him, 269 A.D.; but Paul would not comply with the decree, till at last, after the overthrow of his great patron, Zenobia, queen of Palmyra, it was enforced by order of the Emperor Aurelian, 274 A.D., who declared that the controversy had been determined by the judgments of the bishops of Italy and in particular the bishop of Rome. The Samosatenes are also called Paulinians.

SAMOTHRACE, or SAMOTHRAKI (Turkish, Samadrek): an island of the Ægean Sea, about 40 m. n.w. of the entrance to the Dardanelles, and nearly opposite the mouth of the Hebrus, 36 m. from the coast of Thrace. It is rugged and mountainous and of almost oval form; its highest summit, Saoce, reaches an elevation of 5,248

ft. On the n. coast are sulphur springs of considerable renown. The principal products are grain, wood, oil, honey, and wax, and on the coast there is a considerable sponge fishery carried on by traders from Smyrna. In the n. part of the island the ruins of ancient Samothrace were found (1873-5) consisting of Cyclopean walls; a Doric temple of marble, and another of circular form. Samothrace was of importance from early times, and is frequently mentioned in the works of Pliny, Homer, and others. Here Poseidon witnessed the contests between Greeks and Trojans on the plains of Troy. But its chief renown was due to its having been the seat of worship of the Cabiri, and to its religious mysteries, supposedly derived from the Pelasgians. The island is once mentioned in history in connection with the expedition of Xerxes, one of its ships having taken a conspicuous part in the famous battle of Salamis. The island was first colonized by Phœnicians, afterward joined by Greeks. It always enjoyed autonomy, partly owing to its sacred character, partly to its lack of political importance—due to the fact of its having no good harbor. Saint Paul visited the island in the course of his second missionary expedition (Acts xvi. 11). The inhabitants are mostly Christians. Pop. 4,600.

SAM'OVAR: a Russian tea kettle, the water in which is boiled by means of hot coals contained in an iron tube, and then poured over the tea.

SAMOYEDES, *săm-oy-ēdz':* Ural-Altaic race widely spread over the extreme n. of e. Europe and of Asia; one of the four families of the great Altaian stock. Originally, the Samoyedes inhabited the whole vast Siberian plain from the Altai to the Arctic Sea; but for many hundred years Mongolian peoples have forced themselves in among them. Their chief seat at present is the region between the Obi and the Yenisei. They have been very little influenced by Russian civilization or Christianity, retain in great measure their old manners and customs, and live by fishing, or rearing reindeer. The most important researches concerning their ethnographic and linguistic relations have been made by Castren.

SAMP, n. *sămp* [an Amer.-Indian word]: in *Amer.*, bruised maize boiled and eaten with milk.

SAMPAN, n. *săm'păn*: a boat used on the Chinese rivers, and elsewhere, for the conveyance of merchandise, and also frequently for habitation.

SAMPHIRE, *săm'fīr* or *-fėr* [supposed corruption of F. *Saint Pierre*, St. Peter], (*Crithmum*): genus of plants of nat. order *Umbelliferæ;* having compound umbels, and an oblong fruit, rather flattened at the back, with five winged ridges, and many *vittæ* spread all over the seed. COMMON SAMPHIRE (*C. maritimum*) is a perennial native of Europe, growing chiefly on rocky cliffs near the sea. Its radical leaves are triternate; those of the

stem have lanceolate and fleshy leaflets. The stem is about 1½ ft. high, the flowers yellow. S. makes one of the best of pickles, and is also used in salads; it has a piquant, aromatic taste. It is generally gathered where it grows wild, but is sometimes successfully cultivated in beds of sand, rich earth, and rubbish, occasionally supplied with a little salt.—*Inula Crithmoides*, perennial plant, allied to Elecampane (q.v.), and of nat. order *Compositæ*, native of the sea-coasts of England, is

Golden samphire (*Crithmum maritimum*).

used in the same way as S., and is often called GOLDEN SAMPHIRE.—The young shoots of *Salicornia herbacea* (see GLASSWORT) also are substituted for it as a pickle, and sold under the name MARSH SAMPHIRE. In this country it is sometimes known as samphire, and is common on the coast and interior salt-marshes. It is 6–12 in. in height, leafless, fleshy, jointed, like several other species, and is much eaten by cattle.

SAMPLE, n. *săm'pl* [a corruption of Eng. *example* or *ensample*: L. *exemplum*, a model (see EXAMPLE)]: a specimen; a part shown as evidence of the quality or character of the whole; example: V. to put up or take specimens of; to show something similar; to match. SAMPLING, imp.: N. the act of taking small quantities of wines, spirits, etc., or of merchandise from the bulk, from the docks or bonded warehouses, to exhibit them for sale. SAM'PLED, pp. *-pld*. SAM'PLER, n. *-plĕr* [L. *exemplar*, a pattern]: a specimen; a piece of ornamental needle-work formerly done by girls for improvement. SYN. of 'sample, n.': specimen; example; instance; illustration.

SAMPSON, *sămp'son*, DEBORAH: 1760, Dec. 17—1827, Apr. 29; b. Plympton, Mass. Under the name of Robert Shurtleff she enlisted in the revolutionary war, and served with great credit for three years. While sick with brain fever her sex was discovered by the surgeon. After her discharge she married Benjamin Gannett of Sharon, Mass. Congress gave her a pension and a tract of land. Her army life is described in *The Female Review*, which she published 1797 (new ed. 1866).

SAMP'SON, EZRA: 1749, Feb. 12—1823, Dec. 12; b. Middleborough, Mass. He graduated from Yale College 1773, was settled as pastor of the Congl. church at Plympton, Mass., 1775, removed to Hudson, N. Y., 1796, was one of the editors of *The Balance* 1801-03, edited the *Connecticut Courant* 1804, and was a contributor to its columns for many years. He became judge of Columbia co., N. Y., 1814. He published *The Historical Dictionary* (1804); *The Brief Remarker on the Ways of Man* (1817, 55); and other works. He died at New York.

SAMPSON, WILLIAM THOMAS, American sailor; b. 1840, Feb. 9—1902, May 6, in Palmyra, N. Y.; graduated from the U. S. Naval Academy at Annapolis, 1861. He was commissioned as "master" to the frigate *Potomac*, and in 1862 promoted to lieutenant, serving on the sloop *John Adams* until 1864, when he was stationed at Annapolis. During 1864-5 he served on the *Patapsco*, then attached to the South Atlantic blockading squadron, and was on board that vessel when she was sunk in Charleston harbor, 1865, Jan. From 1865 to 1867 S. served on the *Colorado*, flagship of the European Squadron, and returned to the Naval Academy (1868), where he remained till 1871. He received his commission as lieutenant-commander 1866, July 25, and as commander 1874, Aug. 9, serving at the time on the European station. He commanded the *Swatara* of the Asiatic Squadron in 1880, and returning in 1882 was appointed assistant superintendent of the Naval Observatory in Washington and later (1886) superintendent of the Naval Academy, a post which he retained till 1890. His other appointments have been: Chief of Ordnance Bureau, 1893-97; commander of the U. S. S. *Iowa*, 1897; President of the Board of Inquiry into the cause of the destruction of the U. S. S. *Maine* in Havana harbor (q.v.) 1898, Feb. 15. On the declaration of war between the United States and Spain S. was ordered to command the North Atlantic Squadron, with rank of acting rear-admiral, being advanced to the full rank 1898, Aug. 10. Commanding his own and Commodore Schley's squadron at Santiago, he was, however, present only during the last part of the engagement with Cervera's fleet, which was fought by Schley as second in command. He was commander of the Boston navy yard, 1899-1901; on 1902, Feb. 9, was retired.

SAMSHOO, or SAMSHU, n. *sâm'shô* [Chinese]: Chinese spirit distilled from rice.

SAMSON, *săm'son* (Heb. *Shimshon*, compare *Shemesh*, sun): Hebrew champion: b. in Zorah in the tribe of Dan; son of Manoah. For 20 years he was 'Judge' over the s.w. tribes of Israel—perhaps only of Dan: his period is not certain, whether previous to Eli, or (more prob.) contemporaneous with him; he died prob. abt. B.C. 1115. The title 'Judge' appears to have been bestowed in recognition of his daring and extraordinary exploits against the neighboring Philistines, who at his birth held a great part of Palestine tributary. There is in the whole account of his deeds no sign of any superior authority vested in him. The narrative is almost wholly local, not dealing with the wider sphere of Israel. His life is surrounded by a marvellous halo from birth to death. To his mother, long barren (cf. Gen. xviii. 10, I Sam. i. 2, etc., Luke i. 7, etc.), there appeared an angel, who promised her a son on the condition that he should become a Nazarite. He is born; and goes forth on a life full of exploits of physical strength, though with small manifestation of intellectual or moral force; and in his death he destroys more of the hated Philistine oppressors than in his life. He shows no serious religious purpose, nor does his nation receive through him, as through the other 'Judges,' any great deliverance. S. may be a type of the Israel of his day—scarcely conscious of its national life or of its divine vocation—yet serving to fill its low place in the long historical sequence. S. may thus illustrate the power of *faith* in even its lower sphere and in even its less worthy operations in which it is limited by the unspiritual semi-brutish nature with which it has to deal.

Whatever theory may be adopted regarding the miraculous works ascribed to S. (and commentators have been ingenious in methods for explaining these), the tendency of modern scholarship is to reject at least the theory that the whole story is a popular myth and that S. was not a real person; also the attempt to identify him with the Tyrian sun-god Baal-Shemesh (or Hercules). It is deemed possible, however, that some of the stories of Hercules may have been derived through the Phœnicians from the history of Samson. Altogether, he is too human ever to have been an allegory or a parable, the moral of which would, indeed, hardly be perceptible. He appears in Scripture as a man of blemished type, but doing exploits under the animation of an unyielding patriotic purpose, which purpose had its place in the comprehensive divine plan of the Hebrew history.

SAMSON'S POST, n. *săm'son'z pōst* [*Samson*, the ancient champion of Israel against the Philistines, renowned for his great strength, and *post*]: in a *ship*, a strong wooden upright post or pillar in the centre of the hold, resting on the keelson.

SAMUEL, *săm ū-ĕl* (Heb. *Shemuel*, heard by or asked from God): the last *Shofet* or Judge of Israel, the 'first of prophets,' founder of the schools of prophets, and mediator of the transition from the Judges to the monarchy in Israel: conjecturally about B.C. 1137–1058; b. among the hills of Ephraim; son of Elkanah, and of Hannah, a woman of no ordinary gifts, and almost a Nazarite herself, who dedicated the long yearned-for child to the Lord even before his birth. Elkanah was of Levitic descent, living, however, not among his own tribe, but in Ephraim. S., brought up in the sanctuary at Shiloh, under the eyes of Eli, there received his first prophetic call, and from that time his prophetic mission was decided. For about 20 years from the death of Eli and his sons, we hear nothing of S. The first public manifestation of his assumption of the office of judge is his convoking an assembly at Mizpeh, and routing, at the head of the people, the Philistines—his first and probably his only military achievement. Dwelling in his own native city of Ramah, where he had erected an altar, he annually went 'on circuit' to the three principal sanctuaries w. of the Jordan—Bethel, Gilgal, and Mizpeh—there to instruct and judge the people, and break them from their idolatrous habits, to which they were wont to yield, in imitation of the peoples around them. For the needed reformation he organized special schools of teachers and prophets, which seem to have formed colonies (Naboth, Bethel, Gilgal, Jericho), and to have moved about in large numbers. These fraternities were destined to take an important place in the commonwealth, and to exercise the greatest influence on the internal as well as the external affairs of the state, while they were the teachers of the people, expounding and developing the Mosaic law, and keeping the sacred traditions alive within the houses and hearts of Israel.

The peace that S. had restored—for during his lifetime the harassing raids from neighboring heathen had entirely ceased—and the happy use that he made of the peace by consolidating the religious institutions and the internal power and union of the people, must have impressed the people with the advantage of being ruled by a firm and capable head and hand. It would have been easy for S. to have procured for himself an election as king of Israel; but the establishment of a dynasty appeared to him contrary to the theocratic character of the law. When, however, his two sons, Joel and Abiah, whom he had installed provisional or supplementary judges, 'turned aside after lucre, and perverted judgment,' and the complaints of the people were loud against them, S. was pressed by its representatives who foresaw a time of terrible anarchy and lawlessness at his approaching demise; and he was obliged to yield to the general wish of installing a king to judge them 'like all the nations': see JEWS: SAUL. For the further events of S.'s life, see DAVID. As to

his character, we cannot but see in him one of the wisest, most sagacious, unselfish, patriotic heroes. He was, doubtless, severe and energetic in the extreme, following the path that seemed to him indicated by Jehovah as the only one leading to the common welfare in an age of barbarism, brutality, superstition, and of a paganism world-wide and seductive, threatening the total absorption of the one nation that worshipped the living God. Gifted with both the spiritual and worldly supreme power over the people, at a time when they had neither political unity, nor laws, nor a *cultus*, he succeeded in rousing the public spirit, in uniting all the tribes under one banner, and in shaking off the Philistine yoke. He routed idolatry, and raised, by the institution of prophetic schools, the Mosaic religion to the highest eminence, forming also by these schools a healthy counterpoise to priestcraft. That on finding Saul negligent to certain dicta of the law, whose preservation had been the sole reason for his election, S. casts aside all personal love and fear, and to save Israel and keep its constitutions intact, chooses a more worthy head for the commonwealth, is not more than was the duty and the natural action for this most zealous champion for Jehovah's commands. The people themselves gave him the most honorable testimony for his uprightness and justice, and later ages place him side by side with Moses.

S. seems, after having anointed David, to have retired from public activity, and to have lived in comparative seclusion at Ramah. The period of his judgeship is not given; and his age at death is not easily calculated—being variously conjectured between 60 and 90 years. He was buried at Ramah, and his tomb is still shown at Nebi Samwil, though, according to Jerome, his remains were removed, under Emperor Arcadius, to Thrace. All Israel mourned him as they had mourned none since Moses.

SAM'UEL (SHEMUEL), BOOKS OF: two canonical books of the Old Test.; forming originally one work, but by the LXX. and Vulg. (followed by the recent Hebrew editions since Bomberg), and the Authorized Version. divided into two books, the first closing with the death of Saul. They are named from Samuel, the principal figure in them. He not only stood as the spiritual and temporal head of the commonwealth, but he also anointed Saul and David, and exercised an important influence on their rule. The narrative, beginning with the high-priesthood of Eli, concludes with the death of David; thus three principal periods are noticeable—1. The restoration of the theocracy, of which Samuel assumes the leadership (I. i.—xii.); 2. The history of Saul's kingship till his death (I. xiii.—xxxi.); 3. David's reign (II.).

The plan of the whole work is to depict the development of the theocracy from the end of the period of Judges to the end of David's reign, its humiliation and

its glory under Samuel and David, whose history is, in portions, told with biographical minuteness. As to the composition and unity of the books, criticism has been busy and ingenious; but scholars have prevalently inclined to see in them not a loose compilation from a number of stray sources, but a consecutive narrative drawn from ancient and authentic documents. The character of the narrative itself, occasionally dwelling at large on biographical episodes, occasionally assuming the brevity of a mere chronicle, and at times repeating itself at length, is quite in accordance with ancient Semitic historiography. It has been supposed by some that the books of Samuel were composed by the same hand that wrote the books of Kings, but they belong to a much earlier period. The author appears to have lived after the separation of the kingdoms, but long before the Exile, the language being remarkably pure, and quite free from late forms and Chaldaisms. The author may probably have been a prophet of the time of Solomon. The Talmudical notion of Samuel's authorship has been rejected by the critics, as inconsistent with the contents and circumstances of the book. There are glosses in the book due to later hands. Of sources, only the 'Book of Jashar' is mentioned in the work. The author, if he did not use real annals of the kingdom, which were only begun under Solomon, had, at all events, a certain number of prophetical narratives of Samuel's, Saul's, and David's lives and doings before him. As regards the occasional verbal agreement between Samuel and Chronicles, often commented on, we may assume either that the latter drew on the former, or that they both—which is more probable from internal evidence—drew on the same source, and modified their accounts according to their special tendencies. Altogether, the work bears the character of authentic record. Of modern commentators, see Hensler, Königsfeldt, Thenius, Ewald; also, *Critical and Experimental Commentary*, by Jamieson Fausset, and Brown; and in J. P. Lange's Commentary, the vol. on Samuel, by Philip Schaff.

SAMURAI: the feudal warriors of Japan, who, prior to the revolution of 1867-8, comprised about one-sixteenth of the population, and are now represented by the *shizoku*, or knights. They were distinguished by indomitable courage, their marvelous feats of arms, fervent patriotism, intense loyalty, and a strong antipathy to foreigners, which was in marked contrast to the hospitable and courteous demeanor of the mass of the population. They were the military retainers of some 276 daimios or feudal chieftains, the more powerful among whom were those of the southern clans Satsuma, Choshiu, Tosa, and Hizen. After the re-opening of foreign relations due to United States initiative in 1854, the enlightened Japanese discovered at once that to place themselves commercially and politically on a level with the

progressive nations of the world they had to adopt Occidental methods, and the prominent chiefs and their samurai were the first to advocate the suppression of the Tokugawa shogun, the supremacy of the mikado, the surrender of feudal powers, and a reorganized administration for the building up of a constitutional monarchy, most of which was effected by the revolution of 1868.

The samurai expected that the military and naval services would be exclusively reserved for them and their descendants. The radical measures adopted in 1871, however, led to the total abolition of feudalism, and the absorption of the samurai into the mass of the people, in many cases with a praiseworthy self-abnegation, but in others not without serious opposition. That of the famous Saigo of Satsuma, hitherto one of the most prominent reformers, culminated in the civil war of 1877, and the total defeat of the samurai and their pretensions.

SAM'VAT: a method of reckoning time in India, generally used except in Bengal. Christian dates are reduced to Samvat by adding 57 to the Christian year.

SAMYDACEÆ, *săm-ĭ-dā'sē-ē:* natural order of oxogenous plants, tropical trees or shrubs, mostly American. The order contains about 80 known species, generally characterized by astringency in bark and leaves. Some are used in medicine, for poultices of wounds, lotions for ulcers, etc. The foliage of *Casearia esculenta* is eatable.

SAN. See ZOAN.

SANAA, *sâ-nâ':* principal district in Yemen or Arabia Felix, corresponding to ancient Sába, or Sheba, the land of the Sabeans. Its extent is very undefined, but it may be taken to include the country round the capital bearing the same name, to a distance of half a day's journey on the w., n., and e.; and on the s. bounded by the Tehâma and the districts Láhej and Yáffa.

While the dynasty of the Imáms existed, their sway extended over a much greater space, sometimes, indeed, over the whole of Yemen. Gradually it was encroached upon by the Sheikhs, who had been subject or tributary to them, and by the Turks. A bad government brought intestine strife; on the death of each sovereign, the succession was disputed, until at length the very shadow of regular government has passed away. 1872, July, Sanaa was again occupied by the Turks, who afterward overran the greater part of Yemen.

The city of Sanaa, former capital of the Imáms of Yemen, is a deep and beautiful valley, 20 or 30 m. long, 6 or 7 m. wide, 4,000 ft. above sea level (pop. estimated —city 20,000, valley 70,000). This valley is bounded e. by a high range of mountains called Jebel Nikkum, and is studded throughout its length with large villages.

The city and its suburbs are surrounded by high walls; and, including the gardens, the circumference is about

five and a half m. The houses are of brick, well and strongly built, and most of them furnished with fountains, while the palaces of the Imáms approached magnificence. The Jews, of whom even now there are about 20,000, have a quarter to themselves, about half an hour's walk from the Mohammedan town.

SANABLE, a. *săn'a-bl* [L. *sanab'ĭlis,* that can be healed, curable—from *sanārĕ,* to heal—from *sanus,* sound, healthy]: that may be healed or cured. SAN'ABIL'ITY, n. *-bĭl'ĭ-tĭ,* or SAN'ABLENESS, n. *-bl-nĕs,* the state of being sanable; curableness. SAN'ATIVE, a. *-tĭv,* having the power to cure or heal. SAN'ATIVENESS, n. *-nēs,* the power of healing. SAN'ATORY, a. *-tėr-ĭ* [It. *sanatorio*; sanatory, healing]: healing; curing.

SAN'ATO'RIUM, n. *-tō'rĭ-ŭm,* a health-station, especially among hills; a resort for invalids—incorrectly spelt SANITARIUM. *Note.*—The spelling *sanitary* is often used in the same sense as *sanatory,* but improperly. Though both are derived from the Latin, *sanārĕ,* to heal, *sanatory* properly signifies 'conducive to health,' and is applied to curative measures, after health is lost, while *sanitary* has the more general sense of 'pertaining to health,' and is applied to preventive measures. See SANITARY.—SYN. of 'sanable': healable; curable; remediable.

SAN ANTONIO, *sân ân-tō'nĭ-ō:* city, capital of Bexar co., Tex.; on San Antonio and San Pedro rivers, and on the Southern Pacific, the International & Great Northern, the San Antonio & Aransas Pass and other railroads; 80 m. s.w. of Austin, 250 m. n. by w. of Brownsville; 36 sq.m. It is in a plain, near a range of limestone hills from which excellent building material is taken; is supplied with water from the springs at the head of San Antonio river; lighted by gas and electricity; has valuable water power; and, beside important manufactures, has a large interior and Mexican trade. Both rivers run through the city and are spanned by several iron and wooden bridges. The part between the rivers is known as the American quarter; that e. of the San Antonio river as the Alamo or German quarter; and that w. of the San Pedro river as Chihuahua or the Mexican quarter. The American quarter contains the principal public and business buildings; the German the most attractive residences; and the Mexican many adobe houses of early days, and streets retaining their former Mexican and Spanish names. The city has a net public debt of $2,098,000; the assessed valuation of all taxable property is $54,000,000. There are numerous public school buildings. The principal buildings are the new U. S. Custom-house and Post-office on Alamo Plaza, the City-hall on the Milit. Plaza; Rom. Cath. cathedral, two convents, hospital, and female orphan asylum; opera-house; public high school; St. Mary's College (Rom. Cath.); St. Mary's Hall (Prot. Episc.); Ursuline Acad. (Rom. Cath.); and several hotels. Here also is a U. S. military reservation

(200 acres) and the headquarters of the department of Texas. There are several national and private banks; and daily, weekly, and monthly periodicals. The chief manufactures are flour, beer and ale, cotton-seed oil, meat extract, and artificial ice; and the principal trade commodities are agricultural products, live-stock (particularly horses), wool, and hides.

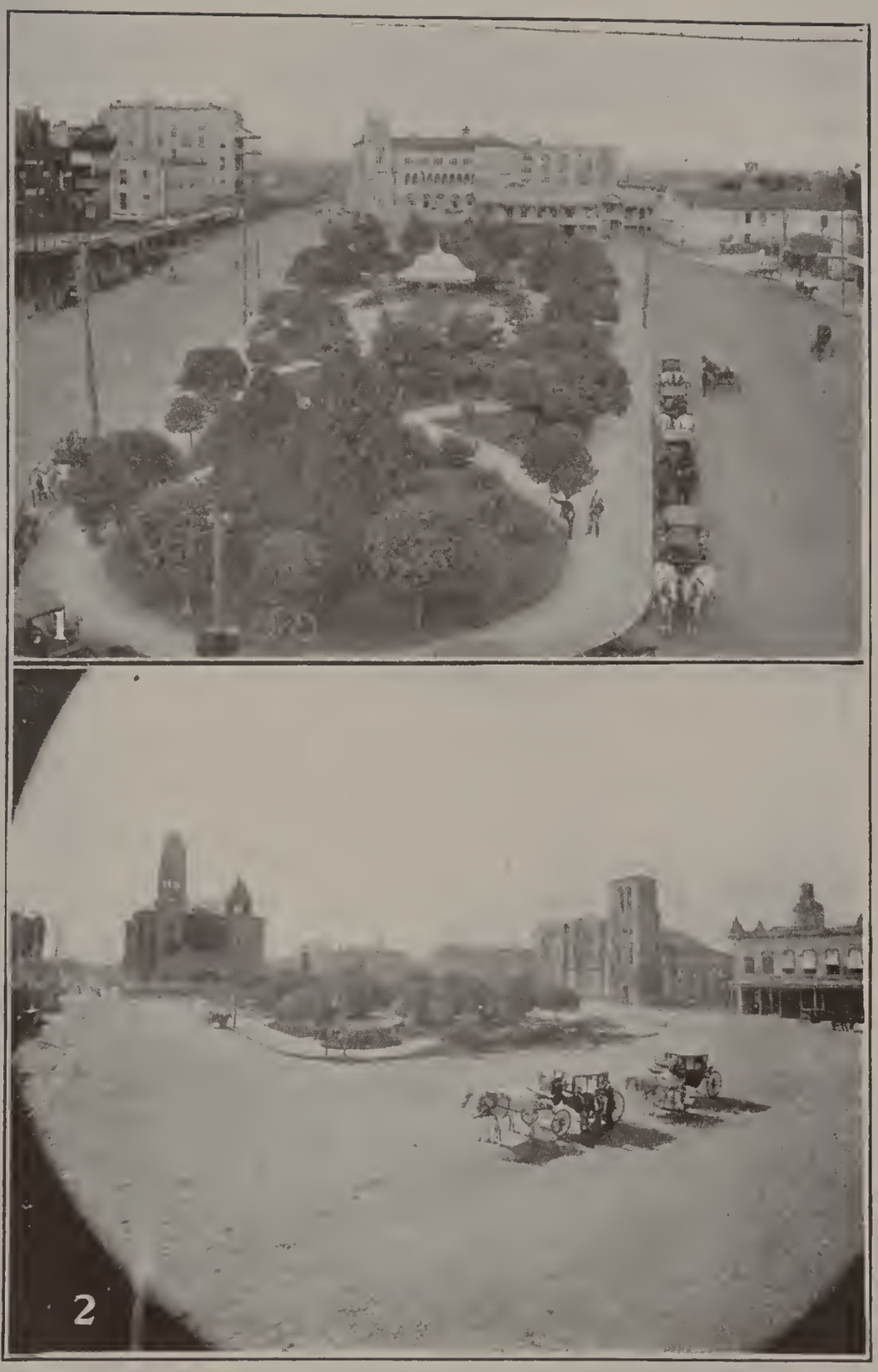
San Antonio was founded by the Spaniards for a military post 1714, and four years afterward Franciscan missionaries established here the mission of the Alamo. Subsequently both the fortification and the mission were removed from their original site on the right bank of San Pedro river to the left bank. The new mission building was so stoutly constructed that it served as a fort during the struggles of the Texans for re-establishment of the constitution of 1824 and for independence. It was the scene of a treacherous massacre of Texan patriots by order of the Mexican Santa Anna 1836, Mar. 6, and its ruins are now cared for by the city. San Antonio was the capital of Texas under both Spanish and Mexican governments; and was incorporated as a city 1873. Pop. (1900) 53,321; (1910) 96,614.

SAN BENITO, n. *săn bĕ-nē'tō* [Sp. *sambenito*—from *saco,* a sack or loose garment; *benito;* L. *benedictus,* blessed]: a short linen dress, painted with demons, put over those condemned to the flames by the Inquisition.

SAN BERNARDINO, *sân bĕr-nâr-dē'nō:* city, capital of San Bernardino co., Cal.; on the California Central and the California Southern railroads; 60 m. e. of Los Angeles. It is supplied with water from artesian wells at such elevation that streams can be thrown from hydrants over the top of the highest building; has court-house, hall of records, hotels, banks, churches, state hospital for insane, orphan asylum, St. Bernardine of Sienna academy, high school, public and parish schools, and a private business college. The Santa Fé railroad shops employing 1,400 men, lumber mills, grain elevators, and crate factories are the chief manufacturing establishments, and the city makes extensive shipments of fruit, grain and lumber. Pop. (1900) 6,150; (1910) 12,779.

SANBORN, *săn'bérn,* FRANKLIN BENJAMIN: born Hampton Falls, N. H., 1831, Dec. 15. He graduated from Harvard College 1855, soon became a member of the Massachusetts state board of charities, was one of the founders of the Clarke Institution for Deaf Mutes, and was prominent in reorganizing the state methods of dealing with children and insane people who were objects of its charity. He was one of the founders of the American Social Science Association and of the Concord Summer School of Philosophy. He was an earnest abolitionist before the civil war. For many years he has been an editorial contributor to the *Springfield Republican.* He has published *Life of Thoreau* (1882); *Life and Letters of John Brown* (1885); and a large number of reports.

SAN ANTONIO.



1. Alamo Plaza. Mission Chapel on right. Federal Building in background.
2. Main Plaza, Court House and San Fernando Cathedral.

SANBORN, KATHARINE ABBOTT (pen name KATE SANBORN): born Hanover, N. H., 1839. She was a teacher in several seminaries, prof. of English literature in Smith College for some years, and has been a newspaper correspondent in New York. She has delivered many lectures, edited calendars, and published *Home Pictures of English Poets* (1869); *Wit of Women* (1886); *A Year of Sunshine* (1887); and other works.

SAN CASCIANO, *sân kâ-shâ'no:* city of central Italy, province of Florence, 10 m. s.w. of the city of Florence. It is well built. The lands belonging to it produce a very strong wine, highly prized in Italy, also, grain, oil, fruit, and mulberries. Pop. abt. 6,800.

SAN CAR'LOS: see CAMPINAS.

SANCHO, n. *săng'kō* [etym. not apparent]: instrument of the guitar species, made of hollowed wood and furnished with a long neck. It is strung with the tough fibres of a creeping plant. It is tuned by means of sliding rings.

SAN CHRISTOBAL, *sân krēs-tō'vâl:* city of Mexico, cap. of the state of Chiapas; about 285 m. s.e. of Vera Cruz, 450 m. s.e. of the city of Mexico. The town, founded 1528 as Villa Real, has since been called S. C. de los Llanos, and Ciudad Real; but since 1829 has been known as San Christobal. It is the see of a bishop. Las Casas having been its first bishop, it has sometimes been called San Christobal las Casas. S. is in a fertile valley near the e. base of the Cordillera. Its principal industries are cattle raising, beef packing, the weaving by hand of coarse cotton and woolen goods, and manufacture of earthenware. There are mines of iron and lead in its vicinity. Pop. about 12,000.

SANCHUNIATHON, *săn-kô-nī'a-thon* (SANCHONIATHON, or SOUNIAITHON): the supposed author of a Phœnician history of Phœnicia and Egypt, called *Phoinikika.* He is conjectured to have been a native of Berytus; and the accounts which speak of him as born at Sidon or Tyre, probably take these cities in their wider sense for Phœnicia itself. Our principal information about him is from Philo of Byblus, Greek writer of the beginning of the 2d c., who translated S.'s history into his own tongue; but both the original and the translation are lost, except a few small portions of the latter, preserved by Eusebius, who uses them as arguments in a theological dispute against Porphyry. According to Philo, S. lived during the reign of Semiramis, Queen of Assyria, and dedicated his book to Abibalus, King of Berytus. Athenæus, Porphyry, and Suidas, on the other hand, speak of him as an ancient Phœnician, who lived 'before the Trojan war.' There is also discrepancy between the various ancient writers respecting the number of books in the *Phoinikika.* Orelli (1826) and after him C. Müller (1849) published the remaining fragments of S.; and the hot discussion of their genuineness and value has not yet ceased. Several critics

went so far as to deny the existence of a S. According to some (Lobeck, etc.), it was Eusebius; according to others (Movers, etc.), Philo, who fathered his own speculations upon an ancient authority. Philo was actuated, Movers thinks, partly by the desire of proving that the whole Hellenistic worship and religion was simply a faint imitation of the Phœnician; partly by the desire of lowering the value of the Old Test., by showing the higher authority of the Phœnician writer; and partly, as was the fashion among the unbelieving philosophers of his age, to bring the popular creed into bad repute, by proclaiming his own views under the guise of an ancient sage. Yet even those who deny the authenticity of S. agree in allowing the fragments current under his name a certain intrinsic value, since they are founded on real ancient myths. This is now (with more or less modification by different investigators, Ewald, Bunsen, Renan, etc.) the prevalent opinion. Ewald contends for the real existence of a S., in which he is supported by Renan. Even if there never was a S., it was not Philo who forged him. There seems no doubt that we have but a very dim and confused reproduction of what, after many modifications, misunderstandings, and corruptions, finally passed the hands of Philo and Eusebius, and was by Eusebius, as we said, quoted in a theological disputation. Yet, even if the reality of a S. be assumed, his period—and he insists on a very remote date indeed—must be placed much lower: into the last centuries before Christ, at the earliest. S. would then, it seems, have endeavored to stem the tide of Greek superiority in all things, by collecting, grouping, and remodelling the ancient and important traditions of his own country, and thus proving to both his countrymen and to the Greeks their high importance, in comparison with the Greek productions, on the field of religion and philosophy.

The *Phoinikika* appears to have been not only a cosmogony, but also a history of the author's nation and the surrounding nations; and like similar ancient histories, it began probably with the creation of the world, and contained an account of the Jews. All the historical parts, however, are lost, and nothing remains but a fragmentary cosmogony, or rather two or three different systems of cosmogony, or, according to Movers, merely an Egyptian and Phœnician patchwork, for a brief account of which see PHŒNICIA. One of the chief difficulties for us consists in the Phœnician words of S., which Philo either translated too freely, or merely transcribed so faultily in Greek characters as to render them an everlasting puzzle.

Eusebius further contains a fragment of a treatise by S., *Peri Judaiôn*, but it is doubtful whether this is the work of Philo of Byblus or of S.; and if of S., whether it is a separate work, or merely a separate chapter out of his larger work. A forgery, said to contain the whole nine books of S., and to have been found by a Portu-

guese, Col. Pereira, at the convent of St. Maria de Merinhao, and to have been by him intrusted to a German corporal in Portuguese service, named Christoph Meyer, was published by Wagenfeld (Bremen 1837), and transl. into German (Lübeck 1837), but was very soon consigned to disgrace and oblivion by Movers, K. O. Müller, and Grotefend, the last of whom had at first not only believed in its genuineness, but even written a preface to the *editio princeps*. There never was such a convent or such a colonel; but the fac-simile taken by 'Pereira' in the convent in Portugal was found to have been written on paper showing the water-marks of an Osnabrück paper-mill.

SANCROFT, *săng'kroft*, WILLIAM, D.D.: English archbishop, historically notable as the most distinguished dignitary among the *Non-jurors* (q.v.): 1616, Jan. 30—1693, Nov. 24; b. Fresingfield in Suffolk. He was educated at the grammar-school of Bury St. Edmunds, and at Emmanuel College, Cambridge; and 1642 was elected fellow of his college, but in the following year was deprived of his fellowship by the Puritans for refusing the famous 'Engagement'; after which he went abroad. On the restoration of Charles II., S., after several preferments, was in 1677 raised, against his inclination, to the first dignity in the church—the archbishopric of Canterbury. In his ecclesiastical duties he was commendably faithful. He attended King Charles II. on his death-bed, and earnestly exhorted the once 'merry monarch' to repentance for his past life. In 1688, with several other bishops, he was committed to the Tower by James II., for sending him a petition explaining why they could not conscientiously order his Declaration of Indulgence to be read in the churches. In the events which immediately preceded and accompanied the great Revolution, he acted an ambiguous and perplexing part. At first he refused when James asked him to sign a declararation expressing abhorrence of the Prince of Orange's invasion. Later (1683, Dec.), he even joined in an address to William favoring a free parliament and due liberty to the Prot. dissenters; yet he seems from this point to have drawn back, and to have fallen under the dominion of his theory of the Divine Right of Kings. He was not present at the convention of the lords spiritual and temporal to meet the new monarch, and after the settlement, he refused, with seven other bishops, to take the oath of allegiance to the govt., in consequence of which he was suspended by act of parliament, 1689, Aug. 1. He left Lambeth 1691, June 23, retiring to his native village, where he died. See Macaulay's *History of England*, II., III., IV.

SANCTIFICATION, in Protestant Theology: process, in which, as distinct from justification, the Holy Spirit renews man in the divine image, destroying within him the power of evil, and quickening, educating, and strengthening in him the life of goodness and holiness. Whereas justification is considered as a judicial act on the part of God's free grace, liberating the sinner from condemnation, declaring him just, absolving and pardoning him once for all. Sanctification is reckoned a work or process, advancing in various stages of weakness or strength, and completed only in the future life of the believer when removed beyond the influences of sin that now surround him. In Roman Catholic theology, this distinction between the initiative of the divine life in man (justification) and its progressive development (sanctification), is not maintained, at least in the same precise and logical manner that it has been advocated by Protestants.

SANCTIFY, v. *săngk'tĭ-fī* [F. *sanctifier*—from mid. L. *sanctificārĕ*, to sanctify—from L. *sanctus*, holy; *facĭo*, I make]: to make pure or holy; to purify from sin; to set apart for sacred use; to hallow. SANC'TIFYING, imp.: ADJ. tending or adapted to increase holiness; purifying from sin; setting apart for sacred uses. SANC'TIFIED, pp. *-fīd:* ADJ. set apart for sacred services; consecrated. SANC'TIFICA'TION, n. *-fĭ-kā'shŭn* [F.—L.]: act of making holy; the work of God's grace, by which men are gradually purified in their thoughts and affections; the state of being purified (see below). SANC'TIFIER, n. *-ĕr*, he that makes holy; the Holy Spirit. SANC'TIFYINGLY, ad. *-lĭ.*

SANCTIMONIOUS, a. *săngk'tĭ-mō'nĭ-ŭs* [L. *sanctĭmōnĭa*, sacredness—from *sanctus*, holy: It. *santimonia;* OF. *sanctimonie*, sacredness]: affecting the appearance of sanctity; saintly; holy; devout. SANC'TIMO'NIOUSLY, ad. *-lĭ.* SANC'TIMO'NIOUSNESS, n. *-nĕs*, the appearance of sanctity or devoutness. SANC'TIMONY, n. *-mō-nĭ*, devoutness; holiness; the appearance of sanctity.

SANCTION, n. *săngk'shŭn* [F. *sanction*—from L. *sanctĭo* or *sanctĭōnem*, a decree, sanction—from *sanctus*, holy]: a confirming or giving authority or validity to; ratification; authority; influence or custom: V. to ratify or confirm; to give authority to; to countenance or support. SANC'TIONING, imp. SANC'TIONED, pp. *-shŭnd.*—SYN. of 'sanction, n.': authority; authorization; countenance; support; ratification; confirmation; approbation.

SANCTI SPIRITUS: Cuba; city, province of Santa Clara, 50 m. s.e. of the city of Santa Clara. It was founded in 1514, being one of the seven original towns of the island established by Diego Velasquez. It is connected by a branch road with Las Tunas, on the s. coast, and with the main railroad system of the island; but has little commercial importance. Its situation is unhealthful; its streets are narrow and crooked. It contains two hospitals and a college. Pop. 12,696.

SANCTITY, n. *săngk'tĭ-tĭ* [L. *sanctĭtas* or *sanctĭtātem*, holiness—from *sanctus*, holy]: state of being sacred or holy; purity; holiness; goodness; the being inviolable or solemnly binding, as an oath. SANC'TITIES, n. plu. *-tĭ-tĭz*, in *OE.*, saints; holy beings. SANCTITUDE, n. *săngk'tĭ-tūd* [L. *sanctĭtūdo*, sacredness]: in *OE.*, holiness; goodness.—SYN. of 'sanctity': holiness; piety; godliness; goodness; purity; sacredness; solemnity; devotion; religiousness.

SANCTUARY, n. *săngk'tū-ĕr-ĭ* [F. *sanctuaire*—from mid. L. *sanctŭārĭum*, a sanctuary—from L. *sanctus*, holy]: a holy place; a place consecrated for the worship of the Deity; in a *Rom. Cath. Chh.*, the part around the altar inclosed by a balustrade: *formerly*, a sacred asylum beyond the reach of the civil power (see below); hence, shelter; protection. SANC'TUARIZE, v. *-tū-ar-īz*, in *OE.*, to shelter by means of sacred privileges. SANC'TUARIZING, imp. SANC'TUARIZED, pp. *-īzd*.

SANC'TUARY: formerly a consecrated place giving protection to a criminal taking refuge there; or the privilege of taking refuge in such a consecrated place. Among the Jews, there were cities of refuge to which the slayer might flee who killed a man unawares, and something analogous to a right of sanctuary may be traced in pagan communities also. In the ancient Greek states the temples, or at least some of them, afforded protection to criminals, whom it was unlawful to drag from them, though the food which was being supplied might be intercepted. As early as the 7th c., the protection of S. was afforded to persons fleeing to any church or certain boundaries surrounding it. The canon and more ancient ecclesiastical law recognizes this protection to criminals for a limited period, to give time for composition for the offense, or for the first heat of resentment to pass. In England, about 30 churches including Westminster Abbey, became prominent as refuges, and in several there was a stone seat beside the altar where those fleeing to the peace of the church were held to be safe. One of these still remains at Beverley, and another at Hexham. To violate the protection of this seat, or of the shrine of relics, was an offense too grave to be compensated by a pecuniary penalty. Connected, in England, with the privilege of S. was the practice of *abjuration of the realm*. By the ancient common law, if a person guilty of felony took the benefit of S., he might, within 40 days afterward, go clothed in sackcloth before the coroner, confess his guilt, and take an oath to quit the realm and not return without the king's license. On confessing and taking the oath, he became attainted of the felony, but had 40 days allowed him in which to prepare for his departure, and a port assigned him for embarkation, to which he must immediately repair with a cross in his hand, and embark with all convenient speed. If he failed to depart, or if he returned without license, he was con-

demned to be hanged, unless he happened to be a cler[illegible] (cleric), in which case he was allowed the *benefit of clergy.*

By the ancient canons of the Scottish councils, excommunication was incurred by the offense of open taking of thieves out of the protection of the church. Some churches, however, by their superior sanctity, were held practically to afford a much surer asylum than others, and it was not uncommon for the Scottish kings, with the view of strengthening the hands of the church, to give a formal sanction to particular ecclesiastical asylums. One of the most celebrated sanctuaries in Scotland was the church of Wedale, now called Stow, where was an image of the Virgin believed to have been brought by King Arthur from Jerusalem. A very remarkable right of S. in Scotland, the *privilege of Clan Macduff*, was alleged to have been granted by Malcolm Canmore on recovering the throne of his ancestors. Any person related within the ninth degree to the chief of Clan Macduff, who should have committed homicide without premeditation, was entitled, on fleeing to Macduff's Cross in Fife, to have his punishment remitted for a fine, or at least to be repledged from any other jurisdiction by the Earl of Fife. There is evidence of this privilege having saved Hugh de Arbuthnot and his accomplices from being proceeded against for the murder of John de Melvil of Glenbervie, 1421.

While the institution of S. often enabled criminals to defy the civil power, it was frequently a protection to the innocent from oppression or private enmity pursuing them under the name of law. In rude and unsettled times it operated beneficially by throwing the control of society into the hands of the clergy, who were less tempted than any other class to misuse that power. But as the civil power and authority of the law were strengthened, the right of S. became useless and mischievous; the civil power endeavored to narrow the privilege as far as possible, while the church sought hard to preserve it. The English Reformation, though it greatly restricted, did not abolish S. It was not till 1534 that persons accused of treason were debarred the privilege, and S. for crime was finally abolished 1624; but various precincts in and about London continued to shelter debtors until 1697.

In Scotland, the time-honored S. for debtors, practically obsolete since abolition 1880 of imprisonment for debt (see DEBT), is the Abbey and Palace of Holyrood, with its precincts, including the hill of Arthur Seat and the Queen's Park. The S. affords no protection to a criminal, a fraudulent debtor, or a crown debtor.

SANCTUM, n. *săngk'tŭm* [L. *sanctus* or *sanctum*, holy]: a sacred place; a private retreat or room, as an editor's *sanctum*. SANCTUM SANCTORUM, *săngk-tō'rŭm* [L. the holy of holies]: the most holy place. SANC'TUS, n. *-tŭs*, anthem in the Eucharistic service, originally beginning with the L. word *sanctus*, holy: see TERSANCTUS.

SAND, n. *sănd* [Icel. *sandr;* Dut. *zand;* Ger. and Dan. *sand*]: various shells, stones, and other substances reduced to powder or fine particles, usually by the action of water, found in the beds of seas, rivers, and within the earth (see QUICKSAND): V. to sprinkle with sand. SAND'ING, imp. SAND ED, pp.: ADJ. covered with sand; in *OE.*, barren; sandy in color; short-sighted. SANDS, n. plu. *săndz*, a desert tract of land consisting mostly of sand; extensive tracts exposed by the ebb of the tide. SANDY, a. *săn'ĭ*, consisting of sand. SAND'INESS, n. *-ĭ-nĕs*, the state of being sandy. SAND-BAG, a bag filled with sand (see SAND-BAGS). SAND-BANK, a flat mound of sand of a greater or less extent, on the shore or in the sea, particularly one on a coast or at the mouth of a tidal river causing obstruction to sea-going vessels. SAND-BATH, a covering for vessels that are to be heated without coming into direct contact with the fire. SAND-BLIND [a corruption of OE. *sam-blind*, half-blind: AS. *sam;* L. *semi*, half]: partially blind. SAND-BOX, a box for sand. SANDBOX-TREE, S. Amer. evergreen tree (see HURA). SAND-DRIFT, a heap or hillock of sand formed by the force of the wind (see LAUNCE). SAND-EEL, a small fish that can dart into the sand. SAND-PAPER, paper made rough with sand or pounded glass, for smoothing and polishing—made in the same way as emery paper (see EMERY). SAND-PILLARS, the sand-storms of desert tracts, like those of the Sahara and Mongolia, in allusion to their whirling and pillar-like form in their onward march. SAND-PIPES, or SAND-GALLS, cylindrical or pipe-like hollows, which occur in chalk-rocks, and which are usually filled with sand, gravel, and clay from above. They descend perpendicularly into the chalk at right angles to the surface, tapering downward and ending in a point; they reach occasionally a depth of 60 ft., and have a diameter varying from 1 to 12 ft. They are produced probably by the chemical action of water, charged with carbonic acid, which exists more or less in all rain-water, especially in water that has been in contact with decaying organic matter. SANDPIPER, a name applied to various grallatorial birds, including the greenshank, redshank, etc. (see below). SAND-SCRATCHES, in *geol.*, rocks or rock-surfaces worn smooth, or marked with scratches and furrows, owing to sand being carried over them by the wind. SAND-STONE, stone composed of consolidated sand (see below). SAND-STORM, a storm of sand. SANDWORT (see ARENARIA). SANDERLING, n. *săn'dĕr-lĭng*, small wading bird, so-called because it obtains food by searching the moist sands of the sea-shores (see below). SAND OF LIFE IS RUN, life has passed away, in allusion to the sand of the hour-glass. TO NUMBER SANDS, to enter on an endless or impossible task.

SAND, GEORGE: see DUDEVANT, AMANTINE LUCILE AURORE.

SANDAL, n. *săn'dal* [F. *sandale*—from L. *sandalĭum*; Gr. *sandalĭŏn*, a sandal: It. *sandalo*]: kind of shoe, consisting of a sole fastened to the foot, with a hollow part to embrace the ankle, and fastened by straps—leaving the upper part of the foot uncovered—worn by the ancient Greeks and Romans; a loose low shoe or slipper;

Sandals.

a strap or band for securing a shoe to the foot (see SHOES). SAN'DALLED. a. *-dald*, wearing sandals; shaped like a sandal. SANDALIFORM, a. *săn-dăl'ĭ-fawrm* [L. *forma*, a form]: sandal-shaped.

SANDAL-WOOD, n. *săn'dal-wûd* [Ar. *sandal:* Skr. *chandana*]: wood of several species of the genus *Santalum*, of nat. order *Santalaceæ* (q.v.), natives of the E. Indies and tropical islands of the Pacific. S.-W. is compact and fine grained, very suitable for work-boxes and small ornamental articles, and remarkable for its

Sandal-wood (*Santalum album*).

fragrance, which, being fatal to insects, adapts S.-W. to cabinets for specimens in natural history; but it is much too expensive for general use. The odor is due to an essential oil, heavier than water. WHITE S.-W., the most common kind, is the product of a small tree (*Santalum album*), native of mountains in s. India and the Indian Archipelago; much branched, resembling myrtle in its foliage and privet in its flowers. The trunk is seldom more than a foot in diameter. YELLOW S.-W. is probably from another species, perhaps *S. Freycinetianum* of the Indian Archipelago and Sandwich Islands; and from these regions the Chinese import it,

chiefly for burning in their temples and in their houses: they reduce it to sawdust, and mix it with paste before burning. A species of *Santalum* (*S. Yasi*) has been found to yield the much-valued S.-W. of the Fiji Islands, where the tree has been almost extirpated by the demand for its wood in commerce.

RED S.-W., or SANDERS, is the product of a very different tree, *Pterocarpus santalinus*, of nat. order *Leguminosæ*, sub-order *Papilionaceæ*, native of tropical Asia, particularly of the mountains of s. India and Ceylon. The tree is about 60 ft. high, with pinnated leaves, having generally three leaflets, and axillary racemes of flowers. The heart-wood is dark red, with black veins, and so heavy as to sink in water. It is used as dye-stuff also by apothecaries to color certain preparations. The Arabs use it as an astringent, and it is the basis of some tooth-powders.—A deep red dye is yielded also by the chips of *Adenanthera pavonina*, tree allied to the *Acacias* (q.v.), native of the E. Indies, whose wood is sometimes called RED SANDAL-WOOD.

SAN'DALWOOD (or SUMBA, *sŭm'bâ*, or JEENDANA, *jēn-dâ'nâ*) ISLAND, called by the natives Tjindana, Sumba, and Tanah Tjumba: island in the Indian Ocean, between 9° 18′—10° 20′ s. lat. and 118° 58′—120° 43′ e. long.; about 120 m. long, greatest breadth 60 m.; 4,966 sq. m. The coast is steep and rocky, so that, except at the w., s., and e. corners, ships can approach quite near. The produce consists chiefly in dye-woods, ebony, timber, cotton, rice, pepper, cocoa, maize, coffee, sugar, wild cinnamon, cocoa-nuts, and various fruits. Little sandal-wood is exported, though abounding in the forests, the natives refusing to cut the trees, which they believe to be the dwellings of their ancestors' souls. Exports are: horses, timber, cotton, pepper, wax, tortoise-shell, tow made from bark, maize, and edible nests. The cliffs swarm with the *Collocalia esculenta*, and collecting the nests is a leading occupation of the men. The Sandalwood Islanders belong to the Malay race, are well made, wiry, and of brownish complexion. The most trifling causes lead them to commit suicide, a crime rare in other parts of the archipelago.—The island is nominally subject to the Netherlands, but the rajahs and regents are almost independent. The principal havens are at Nangamessi on the n., and Tida, about the middle of the s. coast, good anchorage being found in many other parts. Notwithstanding the repressive measures taken by the Netherlands govt., and the destruction 1860 of ten vessels engaged in the slave-trade, it is still extensively carried on by these islanders. —Pop. of island about 1,000,000.

SANDARAC, or SANDARACH, n. *săn'da-răk* [L. *sandarăca:* Gr. *sandarakē*, a red pigment—from Skr. *sindûra*]: friable, dry, almost transparent, tasteless, yellowish-white resin, imported from n. Africa. It is completely soluble in oil of turpentine, but not completely soluble in alcohol. When heated or sprinkled on burning coals, it emits an agreeable balsamic smell. It

Sandarach (*Callitris quadrivalvis*).

exudes from the bark of the S. tree (*Callitris quadrivalvis*), native of n. Africa, of nat. order *Coniferæ*.—The quantity of S. used is not great; it is employed mostly for the same purposes as Mastic (q.v.). The finely-powdered resin is rubbed, as *Pounce*, into the erasures on writing-paper, after which the paper may be written on again without the ink spreading.—The wood of the S. tree is highly balsamic and odoriferous, extremely durable and valuable.

SANDAY, *sân'dā* (or SANDA, *săn'da*) ISLAND: one of the most northern of the Orkney (q. v.) group; pop. 2,000.

SANDBACH, *sănd'băch:* small market-town of Cheshire, England; 25 m. e.s.e of Chester by railway; on an eminence on the right bank of the Wheelock. The people are employed mostly in silk-throwing, and in making salt and shoes. Pop. 6,000.

SAND'BAGS, in Military Works: canvas bags 28 or 30 inches long, 14 to 16 broad; filled with sand or earth, and forming ready means of extemporizing a parapet or traverse against the enemy's fire; they are used likewise for protecting the head of a trench, or tamping the charge in a mine: see MINES, MILITARY. As lining for embrasures or barbettes, sandbags are covered with raw hides to prevent them from taking fire.

SAND BLAST: method of engraving, cutting, or boring glass, stone, metal, or other hard substances, by the percussive force of a stream or jet of sharp sand, driven either by a blast of steam from a boiler, at pressure of 50 to 300 lbs. per square inch, or by an air blast from a fan blower revolved at high velocity, say a 30-inch fan revolving 1,500 to 2,000 times per minute. A hopper supplies the sand, through a tube with a fine orifice, and inclined at any desired angle. The steam or air-blast pipe surrounds this sand tube, with the effect of carrying the sand against the object to be operated on, at almost the velocity of the blast. The cutting force is such as easily to reduce diamond, bite into steel, cut through or carve deep patterns in granite, marble, or other hard stones. A chief use of the sand blast is for obscuring, engraving, and ornamenting glass. The effect on a metal surface, with a low degree of force, is that of a fine, uniform, pitted appearance; and the process is much used for frosting plated goods. The original patent of Gen. B. C. Tilghman, 1870, Oct., was greatly improved, 1884, by Matthewson's device for sweeping away, by an ingenious exhaust arrangement, all the steam of the blast, leaving only cool, dry sand to do the work.

SAND'CRACK: splitting or fracture of the horny fibers of a horse's hoof, extending usually from above downward; when reaching to the quick it causes lameness, and in all cases unsoundness. Horses with thin, weak, brittle feet, spoilt by much rasping, and rattled on the hard roads, furnish the majority of cases. The horn must be thinned for an eighth of an inch on either side of the crack; across the upper and lower ends of the crack, to prevent its extension, the firing-iron should be drawn, making a line nearly through the horny crust. The opening may further be held together by winding round the foot several yards of waxed string or fine iron wire. Except in very bad cases, slow work on soft land may be permitted, but road work is injurious The growth of healthy horn is promoted by applying round the coronet, at intervals of ten days, some mild blistering liniment.

SANDEAU, Léonard Sylvain Jules, *lā-ō-nâr sēl-văn zhûl sân-dō:* French dramatist: b. Aubusson, Creuse, 1811, Feb. 19; d. Paris, 1883, Apr. 24. He came to Paris in 1831 in company with George Sand, and for two years they lived and worked together, contributing to *Figaro* and collaborating on a novel, *Rose et Blanche* (1831), published as the work of 'Jules Sand.' The intimacy was ended in 1833 when he made a visit to Italy. He returned to Paris the next year, however, and resumed his literary career. He became librarian of the Mazarin Library in 1853 and curator in 1859, having the year previously been elected to the French Academy. He was joint author with Augier of *Mlle. de la Seiglière* and *Le Gendre de Monsieur Poirier.*

SANDEMANIANS, *săn-dē-mā'nĭ-anz*, or GLASSITES, *glâs'īts:* religious sect, originating in Scotland about 1730, when its founder, John Glas, native of Auchtermuchty, in Fife, and minister of the parish of Tealing, near Dundee, was deposed by the gen. assembly of the Church of Scotland, chiefly for views which he had published concerning the nature of the kingdom of Christ. In his *Testimony of the King of Martyrs concerning his Kingdom*, founded on the words of Christ (John xviii., 36, 37), Mr. Glas maintained that all national establishments of religion are inconsistent with the true nature of the church of Christ, and was thus probably the first assertor of the *Voluntary* principle in Scotland. He also advocated a system of church-govt. essentially *Independent* or *Congregational.* After his deposition by the gen. assembly, he became pastor of a congregation. His personal worth and piety were acknowledged even by his most strenuous opponents. A number of small congregations or *churches* were soon formed on *Glassite* principles, not only in Scotland, but in England and America; but both in England and America, the name of a follower of Glas, Robert Sandeman, prevailed over his own, and the sect received the name of *Sandemanians.* ROBERT SANDEMAN (1718–71, b. Perth) studied at Edinburgh, was in the linen trade, joined the church of Mr. Glas, and was appointed elder. Removing to London 1760, he gathered a large congregation whose members were called Sandemanians. He came to America 1764, gathered a church in Boston, and one in Danbury, Conn., where he settled 1765. Sandeman is known chiefly from his advocacy of certain views respecting the nature of saving faith, essentially representing faith as 'a bare belief of the bare truth,' which belief, however, both Glas and Sandeman, with at least their immediate adherents, regarded as the fruit of Divine grace and the work of the Holy Spirit. The S. have since the beginning of the 19th c., decreased in numbers. In 1851, there were only six Glassite churches in Scotland, none of which contained very many members; and at the same date only six Sandemanian churches existed in England. There are very few in the United States. The S maintain the necessity of a plurality of teaching *elders* in every church, but do not require any special education for this office, or separation from secular employments; they hold a second marriage a disqualification for it; they deem it unlawful to join in prayer with any one who is not a brother or sister in Christ; they observe the Lord's Supper weekly; they maintain *love-feasts* or dinners between morning and afternoon services, at which it is incumbent on every member of the church to be present; they are rigid in abstaining from things strangled and from blood; and in general hold by the most literal interpretation of other Scripture rules, as concerning the kiss of charity, and the washing of the feet of fellow-disciples; they disapprove of games of chance, and of all use of the lot except for sacred

purposes. Their charity, both to their own poor and to the poor of other denominations, is said to be exemplary. The great philosopher Faraday was a member of this sect.

SANDERLING, *săn'dėr-lĭng* (*Calidris*): genus of birds of the snipe family (*Scolopacidæ*), and without a hind toe; otherwise resembling sandpipers. The Common Sanderling (*C. arenaria*) is a very widely diffused bird, breeding in the arctic regions, and migrating s. on the approach of winter as far as the coasts of Africa, of India, and of Brazil. It is only about eight inches long; its winter plumage very light ash-gray, under parts white, the head and back spotted, shoulders blackish-brown, the wing coverts and middle tail feathers bordered with white, and the rump with fine cross-lines. In spring the plumage acquires a reddish tinge with black markings.

SANDERS, *săn'dėrz*, CHARLES W.: educator: 1805, Mar. 24—1899, July 5; b. Newport, N. Y. He was largely self-educated, taught school for many years, published a series of school books 1838, another series 1860, and many other educational works. He introduced singing into public schools, and with B. A. Russell and W. B. Bradbury compiled a series of juvenile music books. Some of his books were translated into other languages, and were largely used in Europe, S. America, and the W. Indies. Many million copies were sold in this country. He died at New York.

SAND-HILL CRANE (*Grus Canadensis*), misnamed *Brown Crane:* species belonging to the family *Gruidæ* of wading birds, and inhabiting N. America, observed especially in the s. and w. United States. It is of a plumbeous ashy color, lighter on the lower back, darker on the wings, with black legs, feet and bill, the sides of the lower mandible pale toward the end. It differs from the old world *G. cinerea*, which is similar in general color, but has a blackish face and neck. A well-stuffed specimen, not stretched, measured 44 in. in height; the bill 5½ in. from base to tip, on the culmen. The dagger-like bill is a formidable weapon of defense.

SAND-HOPPER (*Talitrus locusta*): small crustacean, of section *Edriophthalma* and order *Amphipoda;* so abundant on some sandy sea-shores that the whole surface of the sand seems alive with the hopping multitudes. This activity is not continuous; but if a mass of sea-weed left by the tide be turned over, countless sand-hoppers leap away, or they may be found by digging in the sand, in which they burrow. The sand-hopper leaps by bending the body together, and throwing it open with a sudden jerk. It feeds on almost any vegetable or animal substance, particularly on what is already dead and beginning to decay. It is itself the food of crabs, and of many kinds of birds.

SAN DIEGO, *sân dē-ā'gō:* city, port of entry, and cap. of San Diego., Cal.; on San Diego Bay, and on the California Southern and the National City and Otay railroads; 450 m. s.e. of San Francisco; 71 sq. m. It is the seaport of s. Cal., and next to San Francisco has the largest and finest harbor on the Pacific coast of the United States. It is locally divided into the old town, some distance inland, and the new town which has sprung up directly on the bay since 1867. The climate is equable the year round, and free from heated seasons. Prior to the building of the new town the principal industry was cattle-raising and the exportation of hides. Since 1869, fruit-raising has become the leading industry and large quantities of oranges, lemons, almonds, grapes, plums, and olives, are now cultivated for eastern shipment. It has flour and planing mills, machine shops, carriage and wagon works, and several other industrial establishments connected with the harvesting and sale of the natural products. Gold mining is successfully prosecuted 50 m. n. of the city. The imports of merchandise 1902–3, June, had a value of $963,014; exports of $168,993. In 1903 the net public debt was $833,000; assessed real and personal valuations $12,154,828; tax rate $1.45 on $100. S. is beautifully laid out; well-drained: lighted with gas and electricity; supplied with improved water-works; horse, electric, and steam-motor street railroads; and has a public park of nearly 1,500 acres. The principal public buildings are the government building, the library, Saint Joseph's Sanatorium and Home for the Aged, several bank buildings, the churches and schools. The educational institutions are Academy of Our Lady of Peace, Saint Anthony's Old Mission Indian Training School, a high school, public and parish elementary schools, and a public library. The city is connected by ferry with Coronado Beach, on the opposite side of the bay, which has a hotel that cost more than $1,000,000. The bay of S. was discovered by Juan Rodriguez Cabrillo 1542; occupied and surveyed by Sebastian Vozciano 1602, Nov.; the first mission in the state was founded here by Francis Junifero Serra, 1769, July 16; the pueblo or municipality was organized 1835, Jan. 1; and the city received its first great impetus to growth 1867. Pop. (1880) 2,637; (1890) 16,159; (1900) 17,700; (1910) 39,578.

SANDIVER, or SANDEVER, n. *săn'dĭ-vĕr* [corrupted from F. *sel de verre,* salt of glass]: whitish-salt scum which forms on glass during its first fusion; glass-gall. It is powdered and used as polishing material.

SAND-MARTIN: see SWALLOW.

SAN DOMINGO, *sân do-mēng'gō*, or SANTO DOMINGŌ, *sân'to* (now the DOMINICAN REPUBLIC): eastern part of the island, of which Hayti is the western part; 18,000 to 20,000 sq. m.; pop. est. (1888) 610,000, mostly negroes or mulattoes. See HAYTI: DOMINICAN REPUBLIC.

As early as 1845 negotiations were begun, looking to its acquisition by the United States, and an American commissioner was sent to make exploration. Under Pres. Pierce, George B. McClellan, then capt., was sent to make a survey of Samana Bay, with a view to securing it as a U. S. naval station. His favorable report, and the negotiations which followed, led to no practical result. Nor did anything come from the visit made by Mr. Seward, sec. of state, and other officials, 1867. Early in Gen. Grant's first presidency, overtures toward annexation to the United States were made by the Baez govt. of S. D., and Grant sent Gen. O. E. Babcock to confer with it and arrange a treaty. In a message, 1870, May 31, to the senate, the pres. earnestly urged receiving S. D. as a terr. of the Union, on grounds of advantage to both countries. In S. D. the popular vote for annexation was 15,000 to 400 against; but in the U. S. senate it met with bitter opposition, through various personal and political complications, and was defeated. The pres. made a further effort by sending out, 1871, Benj. F. Wade, Andrew D. White, and Samuel G. Howe as a commission for thorough investigation. Their exhaustive favorable report on the resources, people, and public opinion of S. D., was laid before congress, but no action on it was taken. The S. D. govt. made fresh overtures 1874 without result.

SAN DO'NA: see DONA, SAN.

SAND'PIPER: common English name of a numerous group of birds, generally referred to the family *Scolopacidæ*, all formerly included in the genus *Tringa*, but now, as occurring in the United States, belonging to seven genera, all of the sub-family *Tringenæ*. The name, however, is of wide, popular use, and is sometimes applied to small plovers and tattlers. There are 25–30 species, some common to both hemispheres. In characters and habits they all are very similar. They are not large; they are very active and graceful; plumage not gay, but pleasing and diversified in colors; legs rather long, lower part of the tibia naked; tail very short, wings moderately long; bill rather short and slender, grooved throughout the whole or a considerable part of its length, straight in some, and a little arched in others. The feet have three long toes before, and one short toe behind; the toes in the genus *Tringa*, as now restricted, are partially webbed at the base, in *Totanus* they are completely separate. They are good swimmers though not often seen swimming; they frequent sandy sea-shores, sometimes in numerous flocks in autumn and winter; and seek their food by probing the sand with their bills, and by catching small crusta-

ceans in pools or in the margin of the sea. Many are birds of passage, visiting far n. latitudes in summer, and spending the winter on s. coasts. The flesh of all the species is good, and some are in much request for the table. For the DUNLIN or PURRE (*Tringa variabilis*),

Redshank (*Totanus Calidris*).

see DUNLIN.—The KNOT (*Tringa canuta*), also known, in different states of plumage, as the RED S. and the ASH-COLORED S., is about ten inches in length, appearing in great flocks on N. Amer. and British coasts in winter. The LITTLE S. or LITTLE STINT (*Tringa minuta*), occurs in India and s. Africa. The name STINT is given to a number of species of *Tringa*.—The PURPLE S. (*Tringa maritimi*) is reckoned among the birds of

Common Sandpiper (*Totanus hypoleucos*).

Iceland, Greenland, Melville Island, Nova Zembla, and Spitzbergen.—Of the genus *Totanus*, to all the species of which the popular name GAMBET is sometimes given, one of the best known species is the REDSHANK (*Totanus Calidris*), a bird which resides in Britain all the year, but known also as a summer bird of passage in

the most n. parts of Europe and Asia, and occurring in winter as far s. as Smyrna, and even in India: it is about 11 inches long, and has its name from its red legs.

The N. American species include the Least S. (*Tringa minutilla*), or Peep, 5½–6 in.; the Pectoral S. (*T. maculata*); the White-rumped S. (*T. fuscicollis*); the Purple S. or Rock Snipe (*T. maritima*); the Black-bellied S. (*T. alpina*); the Red-breasted S. (*T. canuta*); the Spotted S. (*Tringoides macularius*); the Buff-breasted S. (*Tringites rufescens*); also the Bartram S., the Stilt S., and the Semipalmated S.

SANDROCOTTUS, *săn-drō-kŏt'tŭs*, or SANDROKYPTOS, *săn-drō-kĭp'tos*: Greek spelling of the name of the Hindu king Chandragupta, of Pât'aliputra or Palibothra, to whom Megasthenes was sent as ambassador from Seleucus Nicator, and who lived about the beginning of B.C. 4th century.

SANDS, *sănds*, BENJAMIN FRANKLIN: naval officer: 1811, Feb. 11—1883, June 30; b. Baltimore, Md. He became a midshipman 1828, served in the Gulf squadron in the war with Mexico, and 1848–51 commanded a brig near the African coast to aid in suppressing the slave trade, and was afterward with the coast survey and the bureau of construction. He was prominent in blockading operations in the civil war, and was supt. of the Washington naval observatory 1867–73. He was promoted commander 1855, capt. 1862, commodore 1866, rear-admiral 1871, and was placed on the retired list 1874. He died at Washington.

SANDS, JOSHUA RATOON: naval officer: 1795, May 13—1883, Oct. 2; b. Brooklyn, N. Y. He became a midshipman 1812, served under Com. Chauncey on Lake Ontario, and was in several engagements; was in the war with Mexico, and rendered brilliant service at various points, and 1851 was in command of the frigate which took the govt. exhibits to the world's fair at London. He aided, 1857, in laying the Atlantic cable, and afterward in suppressing the filibusters in Central America; was commander of the Brazil station 1859–61, and 1869–72 was port-admiral at Norfolk. He was retired, on account of age, 1861; promoted commodore 1862, and rear-admiral 1866. He died at Baltimore.

SANDSCHAKI, n. *sănd-shâk'ĭ*, or SANDSCHAKI-SHERIF, n. *shĕr-ēf'*: *lit.*, the standard of green silk, the sacred standard of the Mussulmans, 12 feet high, surmounted with a golden hand holding a copy of the Koran.

SANDSTONE: rock formed of compacted, and more or less indurated sand. It is formed by sedimentary deposit from water, of granules resulting from disintegration of older rocks by dynamic action, weathering, and erosion: grains of quartz, hardest of the older rocks, are most abundant; after quartz come other minerals—felspar, mica, etc. S. is 'fine,' or 'coarse,' according to the size of the granules. The granules are usually held together by some cementing medium; on the nature of this cement depend the strength, durability, and beauty of the stone.

Lithographically, the different kinds of S. are classed with reference rather to the cementing material than to the nature of the granules. In argillaceous sandstone the cementing material is clay: if such sandstone has not been subjected to metamorphosis, it decomposes quickly under the action of the atmosphere. Calcareous sandstone has for cementing material calcium carbonate: when the carbonate is present in great excess the stone is called siliceous limestone; the action of acids in the atmosphere on limestone tends to produce disintegration. Ferruginous sandstone has for cementing material an oxide of iron; hence its variety of color—pink, red, brown, and intermediate shades. In siliceous sandstone silica is the cementing material: it is usually hard, durable, capable of resisting great crushing force: consequently it is worked with difficulty. Freestone is a sandstone which works well in any direction. The terms 'arkose,' 'conglomerate,' and 'breccia' have special reference to the character of the granules present. Arkose is made up of the constituents of granitic rocks that have been disintegrated and reconsolidated; and conglomerate is a sandstone in which the granules are rounded pebbles instead of small grains. When the fragments are angular instead of rounded, the stone is called breccia. 'Quartose,' 'felspathic,' and 'micaceous' S. contain respectively the minerals indicated. See BUILDING STONE.

SANDUSKY, *săn-dŭs'kĭ:* city, port of entry and cap. of Erie co., O.; on Lake Erie at the mouth of the Sandusky river; and on the Baltimore and Ohio, the Cleveland Cincinnati Chicago and St. Louis, the Lake Erie and Western, and the Lake Shore and Michigan Southern railroads; 61 m. w. of Cleveland. It has an excellent landlocked harbor; is connected with Detroit. Toledo, Cleveland, and the Lake Erie islands by lines of steamboats; does a large business in fresh fish ($1,500,000 annually), fresh fruits ($1,000,000), wine (2,000,000 gallons), and white and blue limestone and lime; and large quantities of coal, timber, and iron ore are brought here for manufacture and reshipment. The shipbuilding industry is important, and the principal manufacturing establishments include factories in which are made baskets and crates for the shipment of fruits, wire-barrel cooperages, wagon and carriage works, machine shops, engine and boiler, threshing machine and

cement works, flour mills, and furniture factories. There is a govt. fish hatchery at Put-in-Bay. The streets are wide, regularly laid out with private and business houses generally of blue limestone; the water supply is from Lake Erie; there is thorough sewerage, and the city has efficient fire, police, gas and electric light, and street railroad service. Prominent among the civic features is the State Soldiers and Sailors' Home comprising 37 buildings constructed of blue limestone at a cost exclusive of grounds, of $700,000 and accommodating 1,600 persons; also notable are the Federal building, bonded warehouse, co. court-house, infirmary, and jail, the five churches, public and parish schools, free library, etc. S. was settled 1817 around historic Fort Sandusky. Pop. (1900) 19,636; (1910) 19,989.

SAND'-WASP: see SPHEGIDÆ.

SANDWICH, n. *sănd'wĭch* [so-called from an Earl of *Sandwich*]; two thin slices of bread with a thin slice of meat, seasoned with mustard, etc., between them. SANDWICH-MAN, *familiarly*, a man perambulating the streets with an advertisement-board both before and behind him.

SANDWICH, *sănd'wĭch* (i. e., village on the sands): cinque port, market-town, and municipal borough of Kent, England, on the right bank of the Stour, 98 m. e.s.e. of London by the South-Eastern railway. Within the last 800 years the sea has here considerably receded; for S., now two miles from the shore, is described, at the commencement of the 11th c., as the most famous of all the English harbors—*omnium Anglorum portuum famosissimus.* The town is rectangular, and was surrounded by walls, along which a broad path now leads. The streets are confined; and the houses, which seem crushed together, and whose architecture recalls the times of the Plantagenets, are peculiarly antique in appearance. The church of St. Clement's with a low Norman tower, is probably the most interesting edifice. Small vessels importing timber, iron, and coal, and exporting corn, flour, malt, seeds, and hops, come up to the town. Tanning, shipbuilding, and seed-crushing are carried on. Pop. 3,000. S. is about one mile s. of the remains of the anc. Richborough (Roman *Rutupiæ*), which decayed as the sea receded from its port, and S. took its place. S. is mentioned in 959, and was made a cinque port by Edward the Confessor. Thence till Richard II. it was the royal port for the navy, and had 90 ships. The harbor gradually silted up, but was improved 1847. At Richborough many Roman remains have been found.

SANDWICH ISLANDS: former name of the HAWAIIAN ISLANDS (q. v.).

SANDY: see under SAND.

SANDY HOOK, *săn'dĭ hûk:* peninsula below Lower New York Bay; near the n. point of which ocean steamers to and from New York are obliged to pass. It is about 6 m. long, ¾ m. wide in its greatest breadth, and is largely covered with cedars. There are two light-houses on the Navesink Highlands, on the s. side of Sandy Hook Bay, and one about ¾ m. from the n. end of the peninsula. S. H. is now the govt. testing-ground for heavy ordnance, and here are powerful harbor defense works known as Fort Hancock since 1895.

SANDYS, *săn'dĭs,* EDWIN, D.D.: Archbishop of York, and translator of the 'Bishops' Bible:' 1519–88; b. Lancashire. He was educated at Cambridge, where he was proctor and master 1542–47; afterward vicar of Haversham, prebendary of Peterborough, and vice-chancellor of Cambridge. He was a prisoner in the Tower nearly 7 months, for having openly advocated the cause of Lady Jane Grey; escaping to the continent, he returned on the accession of Elizabeth, became bp. of Worcester, afterward of London, and subsequently abp. of York.

SAN'DYS, Sir EDWIN: writer, and promoter of the colony of Va.: 1561–1629; b. Worcester, England; son of the abp. of York. Educated at Oxford, he was an adherent of James I., and was knighted 1603. He was the most prominent officer and active member of the London company that founded Va., 1619–20, and instituted a representative system in the colony, with other wise measures that were pursued by his successor, when he himself had been removed from office by Spanish intrigue. He was author of *Europæ Speculum, or a View on Survey of the State of Religion in the Western Part of the World* (1637). He died in Northborne, Kent, England.

SAN'DYS, GEORGE: traveller and metrical translator: 1577–1644, March; b. Boxley Abbey, Kent, England; son of Abp. Edwin S. He was educated at Oxford, and travelled in Egypt, Mt. Sinai, Palestine, and s. Europe; published *Relation of a Journey* (1615); was treasurer of the colony of Va. 1621–24, where he established the first water-mill, ship-building and iron works; and wrote a spirited translation of Ovid's *Metamorphoses* (pub. 1626) He translated also the 1st book of the *Æneid*, and various books of Scripture. His volume of travels is instructive and elegant. Selections from his poetry were pub. by Rev. H. J. Todd 1839.

SANE, a. *sān* [L. *sānus,* sound in body, whole: It. *sano:* F. *sain*]: sound; not disordered; healthy; not disordered in intellect; of sound reason—the opposite of *insane.* SANE'LY, ad. *-lĭ.* SANE'NESS, n. *-nĕs,* or SANITY, n. *săn'ĭ-tĭ* [L. *sānĭtas*]: the condition or state of being of sound mind; soundness or healthiness of mind.

SAN FELE, *sân fā'lā:* town of s. Italy, province of Potenza, 17 m. n.w. of Potenza. Pop. 10,500.

SAN FELIPE DE ACONCAGUA, *sân fā-lē'pā dā â-kŏn-kâ'gwâ:* city, cap. of the Chilian dept. of Aconcagua; 60 m. e.n.e. of Valparaiso. Pop. 12,000.

SAN FERNANDO, *sân fĕr-nân'dō:* Philippines; (1) Pueblo, province of Cebú, on the e. coast, 16 m. s.w. of Cebú, the provincial capital; pop. 18,200. (2) Pueblo, province of Pampanga, Luzon; on the Manila & Dagupan railroad, 5 m. n.e. of Bacolor. It is the railroad shipping point for Bacolor, with which it is connected by highway; and is an important center of the sugar industry, containing sugar mills and warehouses. It also has an excessive wholesale and retail trade in groceries and drugs; pop. 13,270.

SAN FERNANDO: city of Spain, province of Cadiz, on the Isla de Leon, 9¼ m. by rail s.e. of the city of Cadiz. It is a comparatively modern city, with straight streets, Calla Real, the finest, being more than a mile in length. San Fernando has two parish churches, two hospitals, a school of navigation with an observatory and several convents. It is connected with the mainland by a bridge of boats, and a railroad bridge crosses the channel of Santi-Petri. Between San Fernando and Cadiz are large salt marshes, from which great quantities of salt are made and exported; it also manufactures rum, liqueurs, leather, and soap. Pop., including the suburb of San Carlos, 2 m. distant, and naval arsenal of La Carraca, about 29,000.

SAN FILIPPO D'ARGIRO, *sân fē-lĭp'po dâr-jē'ro* (ancient *Agyrium*): one of the oldest towns of Sicily, Italy, in the province of Catania, near the Salso; about 36 m. n.w. of the city of Catania, 9 m. s.e. of Nicosia. It is the birthplace of the historian Diodorus Siculus. It has extensive marble quarries in its vicinity. Pop. 13,000.

SAN'FORD, Henry Shelton: American diplomatist: b. Woodbury, Conn., 1823, June 15; d. Healing Springs, Va., 1891, May 21. He studied for a time at Heidelberg University and in 1847 entered the diplomatic service and became attached to the Saint Petersburg legation. He was United States minister to Belgium, 1861-9, and rendered service of the utmost importance during the civil war. He negotiated the Scheldt Treaty of navigation and commerce, and the first postal convention with France. In 1877 he was a founder of the International African Association (now the Independent State of the Kongo) and secured the recognition of its independence by the United States. In 1885 he was a delegate to the International Kongo Conference at Berlin, and in 1889 a delegate to the Anti-Slavery Conference at Brussels.

SANFORD: Fla.; city in Orange co., on Lake Monroe, an expansion of the Saint John's river, and on the Florida, T. & K. W., the Sanford & St. P., and the Savannah, F. & W. railroads, 125 m. s. of Jacksonville. The land was sold to Gen. H. S. Sanford in 1870, and he surveyed and cleared the site of the city, and built a saw mill, shops, etc. It is at the head of navigation for large steamers, and exports oranges and other fruits, and early

vegetables. It contains railway car shops, machine shops, fruit preserving and cigar factories. There is a public high school. Pop. (1900) 1,450; (1910) 3,570.

SANFORD: Maine; town in York co.; on the Mousam river, and a branch of the Portland & Rochester railroad; 30 m. s.w. of Portland. The land was purchased from the Indians in 1661, and the project of laying out a town was formed as early as 1676, but no permanent settlement was made till after 1730—the exact date being uncertain. The chief manufacturing industries include shoe factories, woolen and worsted mills, flour and grist mills, saw and lumber mills; the census of 1900 reported a capital of $3,246,015 invested. A large electric power shop derives power from the river, and supplies the factories, and lights for the town. There is a high school established in 1874, and a public library which was founded by a library association in 1898, and became a free public library in 1900. The census of 1900 showed that Sanford was the second largest town in the state and exceeded 7 of the 20 cities in population. Pop. (1910) 9,049.

SAN FRANCISCO: the largest city in California, and the largest on the western coast of America, or in the United States w. of the Mississippi river, ninth in rank as to population in the United States; seventh seaport in commercial importance; is situated on a very hilly peninsula between the Bay of San Francisco and the Pacific Ocean; on the s. side of the strait known as the 'Golden Gate'; lat. 37° 48′; long. 122° 27′. It is the principal seaport on the Pacific coast of the United States, possessing the only commodious harbor, excepting that at San Diego, s. of Puget Sound. The Bay of San Francisco forming this harbor is entered by a strait about three m. long and one to two and a half m. wide, navigable for the very largest ships regardless of tides. The harbor itself is completely sheltered from dangerous winds on all sides; it is about 90 m. long and from 5 to 15 m. wide, and contains excellent anchorage ground and abundance of deep water. It is supplied with dry-docks and every facility for the care of vessels. The city is connected with regular lines of steamships: (1) with all ports on the Pacific coast of North and South America, the distances in nautical miles to the principal points in the north being: Portland, Ore., 653; Seattle, Wash., 804; Vancouver, B. C., 833; Juneau, Alaska, 1,608; Sitka, Alaska, 1,784; the distances to the principal ports to the south being: San Pedro, port for Los Angeles, 393; San Diego, Cal., 482; Mazatlan, Mexico, 1,478; Acapulco, 1,836; Guaymas, 1,954; Panama, 3,473; Valparaiso, 6,606; (2) with the Atlantic seaports and Europe *via* Cape Horn, the distance being: to New York, 13,380; to Hamburg, 14,076; (3) with Hawaii, Japan, China, and the Philippines, the distance being: Honolulu, 2,100; Yokohama, 4,525; Shanghai, 6,000; Hong Kong, 6,100; Manila, 6,250; Singapore, 7,850; (4) with Samoa, New Zealand,

and Australia, the distances being: Apia, 4,200; Auckland, 5,930; Sydney, 7,210. The city is also connected by rail with all points n. and s. on the Pacific coast, and all points in the middle west and east of the United States, the distances being by shortest mail route: to Seattle, 808 m.; to Los Angeles, 482 m.; New Orleans, 2,490 m.; to Chicago, 2,357 m.; to New York, 3,269 m.

History.—The site of San Francisco was first visited by Europeans in the autumn of 1769. Under date of 1775, Nov. 12, Bucareli ordered a fort, presidio, and mission founded on the Bay of San Francisco. The expedition to carry out this order left Monterey 1776, June 12, and arrived on the peninsula June 27. Part of the equipment was sent by sea on the San Carlos, and arrived on Aug. 18. The ceremony of taking formal possession was held on Sept. 17. The ceremonies attending the founding of the mission at San Francisco were held on the 9th of the following October. Vancouver, in his *Voyage Round the World* (iii. 9), describes the settlement as it appeared in 1792. The presidio represented the military authority, while the pueblo and the mission stood for the civil and religious factors respectively. The earliest towns of California were organized under the laws of Philip II. And 'when a pueblo was once established, no matter how or by whom composed, and officially and legally recognized as such, it came immediately within the provisions of the general laws relating to pueblos, and was entitled to all the rights and privileges, whether political, municipal, or of property, which the laws conferred upon such organizations or corporations' (*Cal. Rep.*, 15, 541); and 'among these rights was the right to four square leagues of land, in the form of a square, or in such other form as might be permitted by the nature of the situation' (*Cal. Rep.*, 35, 432). Since San Francisco was bounded on three sides by water it was impossible for the town to have four square leagues of land in a square; a line was, therefore, drawn across the peninsula from e. to w., and 'the four square leagues (exclusive of the military reserve, church buildings, etc.) n. of this line, constitute the municipal lands of the pueblo of San Francisco' (*Cal. Rep.*, 16, 230). Before 1834 the territorial governor and the military commandant of the presidio conducted the government of the town. The former imposed license fees and taxes, and the latter acted as a judge of first instance. A little later an ayuntamiento was formed, composed of an *alcalde*, two *regidores*, and a *syndico*. Between Jan. 8, 1838, and Feb., 1840, the ayuntamiento was abolished, and the government of the town passed into the hands of justices of the peace. After the American occupation the ayuntamiento was re-established. Commodore Montgomery, after he had raised the flag of the United States at San Francisco, appointed Lieutenant Washington A. Bartlett to be the first alcalde of San Francisco under the new

regime. Before the American occupation the alcaldes acted as judges of first instance, and they in a large measure made the law which they executed, 'at least, they paid but little regard either to American or Mexican law further than suited their own convenience, and conduced to their own profit.' In 1847 a common council of six persons was elected, and held its first meeting in September of that year. With this the alcalde assumes some of the functions of a mayor. He presided at the meetings of the council, and could give a casting vote in case of a tie, but could not participate in the discussion. At this time the police force of the town consisted of two elected constables. The next year, 1848, gold was discovered. After the news had become known, the town appeared as if it had been suddenly stricken with a plague. 'Its houses were left unoccupied and unprotected; its former trade ceased; its lots fell to a small part of their value; its two weekly newspapers, *The Californian* and *The California Star,* were suspended in May and June; and the town, deserted by the bulk of its inhabitants, was at one time without a single officer clothed with civil authority' (Moses, *The Establishment of Municipal Government in San Francisco,* 35). But in 1848, Oct., an election was held and the town government was reconstituted. At an election held on Aug. 1, 1849, there were 1,516 votes cast, and John W. Geary, candidate for the office of first alcalde, received the whole number.

The town was incorporated 1850, Apr. 15. California had already adopted a constitution, but it had not been admitted into the Union. The first municipal election under the charter was held 1850, May 1. The common council held its first meeting on May 9 and proceeded at once to plunder the city treasury. It proposed to fix the salary of the mayor at $10,000 a year; and at the same sum the salaries of the recorder, the marshal, and the city attorney. The other officers, including the members of the council, were to have salaries ranging from $4,000 to $6,000 annually. After the admission of California to the Union as a state, the city was re-incorporated 1851, Apr. 15, and the essential forms of the pre-existing government were retained.

In its early history the city suffered from several fires. These occurred 1849, Dec. 24; 1850, May 4; 1850, June 14; 1850, Sept. 17; 1851, May 4, and 1851, June 22. Two effects of these fires were the use of better materials in building and the formation of various hook and ladder, engine, and hose companies. They also called attention to the fact that the city was full of criminals who were making profit out of the fires. This fact and the recognized inefficiency and corruption of the city government led a large number of citizens to unite and organize the famous 'Vigilance Committee,' which flourished in 1851. In 1850, Aug., the Society of California Pioneers was organized. Its declared purpose was 'to cultivate the

1. Cliff House from Pier.
2. View After the Earthquake.

social virtues of its members, to collect, and preserve information connected with the early settlement and conquest of the country, and to perpetuate the memory of those whose sagacity, enterprise, and love of independence induced them to settle in the wilderness, and become the germ of a new state.' The great production of gold, while it led immediately to the abandonment of the city, was the first important ground of its prosperity. As the output of the mines became more and more abundant, prices rose, imports multiplied, and the population increased; but in 1854 the rise had culminated and the flood of gold began to decline. It then became clear that speculation had outrun safe limits, and there followed a severe crisis in mercantile affairs. By 1856 the crime and corruption which were rife in the city had become intolerable to those who wished to live in a decent and orderly community. Affairs reached a critical stage when Mr. King, editor of the *Bulletin*, was murdered by James P. Casey. His vigorous denunciation of crimes and the criminals who infested the city had given great offense. This act was the final incentive to action. The memory of the Vigilance Committee of 1851 was revived, and a new organization effected. On Monday Mr. King died, and on Tuesday Casey and another murderer by the name of Cora, who had killed United States Marshal Richardson, were tried by the executive committee of the recently formed organization. On Wednesday Casey and Cora were hanged in front of the vigilance headquarters. After several months of effort in defiance of the law the committee disbanded, leaving the city rid of many criminals and purged of much of its political corruption. Although there was a decline in the yield of gold in the years between 1854 and 1860, there was at the same time a marked extension of agriculture; and by this the continued prosperity of the state and the city was assured. Then followed the marvelous development of the silver mines.

The growth of the city went forward with almost phenomenal rapidity, when the earthquake of 1906, Apr. 18, and the resulting fire destroyed the business portion of the city. The first shock was succeeded by others with decreasing violence during a period of several days; but almost immediately after the first disturbance fire broke out in some of the wrecked buildings and spread rapidly until nearly the whole of the business section of the city was wrapped in flame. The water-mains having been broken by the displacement of earth-strata, there was no water with which to check the conflagration, and it raged for three days, ceasing only when there was no longer any fuel for it to feed upon. It was one of the most terrible and disastrous of modern visitations. With the exception of a fringe of houses in the southwest and a small section in the northwest, the city was essentially wiped out of existence. The parts that escaped were less

compactly built, consisting chiefly of small, detached two-story residences, which afforded facilities for checking the destructive element. The losses ran into hundreds of millions; in fact it is impossible to estimate with any degree of accuracy the amount of loss entailed by so stupendous a catastrophe. It is claimed that ninety-five per cent of the destruction was wrought by the fire, which became uncontrollable the moment it started. The citizens in building their houses had provided against earthquakes rather than fires, and a large proportion of the buildings were composed of wood, which had been found to be less liable to injury from the quaking of the earth; but when the fire came they melted like match-boxes. Even before the smoke of the conflagration had disappeared the citizens went to work with characteristic American courage to rebuild their ruined homes, factories and shops, and within a short time a new and better San Francisco was arising out of the ashes of the old.

Trade and Commerce.—Most of the foreign commerce of the United States on the Pacific passes through San Francisco. Much of that attributed to other ports terminates in San Francisco. A large part of the imports and exports of domestic produce from California and neighboring states and territories also passes through the city, and much Californian and other Pacific coast produce is gathered at San Francisco and shipped out by rail. San Francisco has, in consequence, extensive wharves and warehouses, and a large coastwise trade. In 1902 San Francisco imported $36,000,000 worth of goods from foreign countries by sea, and exported by sea to foreign countries and Atlantic seaports goods amounting to $47,600,000. The principal countries to which San Francisco sent her exports were Great Britain, $13,250,000; Belgium, $685,000; China and Japan, $10,000,000; Hawaiian Islands and Australia, $8,000,000; Central America and Mexico, $4,000,000; British Columbia, $1,120,000; South Africa, $738,000. The largest imports of foreign merchandise came from Japan, $9,000,000; China, $7,000,000; East Indies, $3,500,000; Central America, $2,900,000; Great Britain, $2,500,000. San Francisco also ships away by sea about $15,000,000 in gold and silver each year, and half as much again by rail. The greater part of the treasure shipped away by sea goes to Hong Kong, Japan, and India. If the treasure shipped is included, the total exports for 1902 amount to $62,500,000. In many years San Francisco receives in treasure more than she sends away, most of it coming from Australia, as that country often pays for wheat she herself has bought or her creditor, England, has bought, by sending gold to San Francisco. The long distances from San Francisco to other great ports make it possible for the sailing ship to hold a large part of this trade. The principal articles exported were wheat, wheat flour, barley, canned fruits, dried fruits, wines, and brandies.

Population.—In 1900 San Francisco had a population of 342,782; in 1890, 298,997; in 1880, 233,959; in 1870, 149,473; and in 1860, 56,802. The census returns of 1850 were destroyed by fire before they became of record. In 1910 the population was 416,912. Of the total population in 1900, 184,866 were males, 157,916 were females, an excess of about 27,000 males. There were only 1,654 negroes in the city. Foreign-born were 116,-885, or 34.1 per cent. There were in the city 13,954 Chinese, and 1,781 Japanese. The number of the latter has largely increased since 1900. The greatest number of foreign-born came from Germany, 35,194. The city contains many Jews, some of whom are prominent in mercantile affairs. Of the total population only 84,998 were of native parentage, 257,784 being of foreign parentage, and of the native whites only 83,558, or 24 per cent, were of native parentage. Only 3.1 per cent are illiterate.

SAN FRANCIS'CO BAY: bay on the coast of California, 50 m. long, with average width 5 m., fronting the city of San Francisco, and forming the best harbor on the Pacific coast. The melting snows of the Sierra Nevada Mountains and the waters of the California valley reach the bay through the Sacramento and the San Joaquin rivers and San Pablo Bay. The outlet of the bay at San Francisco, to the Pacific Ocean, is known as the Golden Gate, a channel 5 m. long, 2 m. wide, and in some places 400 ft. deep, with rocky shores on the n. 1,800 ft. high, and white sand-hills on the s. 350 ft. high. At low tide the entrance to the harbor is one m. wide, 35 ft. deep, and on the San Francisco city front there is ample room for shipping. Among the numerous islands in the bay are Alcatraz, which is fortified and contains 30 acres; Goat Island, 141 acres; and Angel Island, about 800 acres. North of the bay is San Pablo Bay, at the head of which is Mare Island, at which there is a U. S. navy-yard. Into San Pablo Bay the waters of Suisun Bay flow, through the Carquinez Strait.

SAN FRANCISCO MOUNTAINS: group a little n. of central Arizona. They are on the Great Colorado Plateau, and are the highest mountains in Arizona. Challender Peak is 12,794 feet and San Francisco Mount 12,562 feet above sea-level, or about 5,000 feet above the plateau. The group seems to have been formed by volcanic action and by circumdenudation. Lava is found on the summits and slopes of the peaks. From the summit of the San Francisco peak over 100 craters of extinct volcanoes are visible. This peak has a curious formation; it is composed of Triassic sandstone, on a Carboniferous foundation, with a volcanic cone.

SANGALLO, ANTONIO DA: Italian architect: b. Florence 1455; d. there 1534. He built in Montepulciano the church of the Madonna di San Biagio; the palaces Cervini and Bellarmini; in San Savino the palace of the

cardinal di Santa Prassede, in Arezzo the Church of the Annunziata and the Citadel in Civita Castellana.

SANGALLO, ANTONIO DA (CORDIANA): Italian architect, nephew of the preceding: b. Mugello, near Florence, 1485; d. 1546. He designed and built the church of Madonna di Loreto, at Rome; the Porta di San Spirito; the church of San Spirito; the palace Sacchetti; the palace Farnese; all in the same city. He also enlarged the Vatican and executed the famous fountain at Orvieto and had a share in building the Pilgrims' Church at Loreto. He was also successful in the construction of fortincations.

SANGALLO, JULIANO DA: Italian architect (brother of Antonio the Elder): b. Florence 1445; d. there 1516. At Florence he built the monastery of Santa Maria Maddalena de Pazzi and the Palace Condi; in Prato, the church of Madonna delle Carceri; in Cajano the Villa Poggio for the Medici. He also constructed the fortress at Ostia; and in Rome he built the façade of Santa Maria dell Anima; the monastery of San Pietro in Vincoli; and the flat roof in the church of Santa Maria Maggiore. He also constructed the citadel at Pisa. Consult: Redtenbacher, *Die Architektur der Renaissance* (1886).

SANGAMON: a river of Illinois; its head-waters are in Champaign and McLean counties. It flows s.e. to Sangamon co., where it unites with the South Fork of the river, and changes the direction of its course, flowing n.w., then w., then n.w., and enters the Illinois river by two channels. Total length, 225 m. The confluence of the North and South Forks is 6 m. e. of Springfield.

SANGAREE, n. *săng'ga-rē'* [Sp. *sangria*—from *sangre*, blood—from L. *sanguis*, blood]: in *W. Indies*, beverage composed of wine, brandy, and lime-juice, sweetened, and spiced with nutmeg.

SAN GERMAN: Porto Rico; city, near the southwestern coast; 35 m. s.w. of Arecibo. It was settled in 1511. It is in a fertile agricultural region, the prosperity of which has, however, declined. It is a picturesque town, with narrow old-fashioned streets; it contains several churches, a Dominican convent, hospitals, and a seminary. An efficient public school system has been established under the American control, and a new graded school building built. Pop. city 4,300; pop. municipal district 20,246.

SANGFROID, n. *sâng-frwâ'* [F. *sang*, blood; *froid*, cold]: coolness; indifference; composure.

SAN GIL: Colombia, in the department of Santander, is situated on a branch of the Rio Suarez, 30 m. s. of Bucaramanga. It occupies a lofty eminence, with an altitude of 1,140 meters. Tobacco and coffee are cultivated and there are woolen manufactures. Pop. 14,000.

SANGIR, *sân-ghēr'*, ISLANDS: group n. of Celebes; 2°—4° n. lat.; more than 50 in number, of various sizes, nearly all inhabited. The three largest, Great Sangir, Sjiauw, and Tagolandang, with those which surround each, form as it were separate groups. In the S. I. are many mountains, which, except the volcanoes, are clothed to their summits with rich vegetation.— Great S. has 273 sq. m.; pop. 13,000. In the n.w. is a volcano, called Abu, or the 'Ash Mountain,' which has frequently caused great devastation.— Sjiauw also is mountainous; a volcano on the n.e. coast being 6,200 ft. high. Pop. 3,000. Chief town, Uluw.— Tagolandang is populous, and the centre of the successful missionary work in the S. Islands. A small ship belongs to the station, in which to visit the scattered converts and schools.— In all the islands, the areng (*Saguerus* or *Borassus gomutus*), the sago, cocoa-nut, and the finest sorts of timber-trees abound. Maize, rice, katjang (a species of bean), tobacco, cocoa, and the sugar-cane are cultivated.— The Sangirese belong to the Malay race, are well made and brave, but cunning, lazy, and dirty in their habits. This, and scarcity of pure drinking water, make them liable to a loathsome skin-disease. There are four rajahs in Great S., one in Tagolandang, and one in Sjiauw. The govt. is monarchical, somewhat limited by a council.

Toward the end of the 15th. c., the Sangirese became Mohammedan; a century later, under the Portuguese, they were brought over to Christianity. These islands, forming now a Netherlands dependency, have several Dutch Prot. missionaries, and 24 churches, whose buildings are used also for schools. Government supports 8 teachers, the villages 16.— Pop. of group 80,000.

SANGSTER, *săng'stĕr*, MARGARET ELIZABETH (MUNSON): born New Rochelle, N. Y. 1838, Feb. 22. When 20 years of age she was married to George S., who died some years ago. She commenced literary work early in life and has been very successful; was one of the editors of *Hearth and Home* 1871–73, of the *Christian at Work*, 1873–79, and of the *Christian Intelligencer* for many years. She was ed. of *Harper's Young People* 1882–89, and in the latter year became ed. of *Harper's Bazar*. She has published several books for girls, numerous short poems, and *Poems of the Household* (1883), and *Home Fairies and Heart Flowers* (1887). She lives in Brooklyn.

SANGUINARY, a. *săng'gwĭn-ĕr-ĭ* [F. *sanguinaire;* L. *sanguinārĭus* bloodthirsty, cruel — from *sanguis* or *san'guĭnem*, blood]: attended with much bloodshedding, as a battle; eager to shed blood, applied to persons; bloody; bloodthirsty. SAN'GUINARILY, ad. *-ĕr-ĭ-lĭ*.— SYN. of 'sanguinary': bloody; bloodthirsty; savage; cruel; murderous.

SANGUINE, a. *săng'gwĭn* [F. *sanguin*—from L. *sanguis* or *san'guĭnem*, blood]: consisting of blood; resembling blood in color, etc.; hence red, ruddy; having abundance of blood, or more or less engorged blood-vessels; having an active blood circulation, hence healthy, vigorous of body, and vivacious, cheerful, hopeful, self-confident, bold, daring: N. in *OE.*, blood color. SAN'GUINELY, ad. *-lĭ*. SAN'GUINENESS, n. *-nĕs*, the condition or quality of being sanguine; heat or ardor of temperament. SANGUIN'EOUS, a. *-gwĭn'ē-ŭs* [L. *sanguin'ĕus*, bloody]: resembling blood; abounding with blood; constituting blood; of a blood color.—SYN. of 'sanguine': ardent; animated; lively; warm; confident; hopeful; cheerful.

Sanguine.

SANGUINE, *săng'gwĭn*, or MURREY, *mĕr'ĭ:* one of the tinctures in heraldry, denoting blood color, and represented in engraving by lines crossing each other saltireways.

SANGUINIVOROUS, a. *săng'gwĭn-ĭv'ō-rŭs* [L. *sanguis or san'guĭnem*, blood; *voro*, I eat or devour]: eating or subsisting on blood: also SANGUIV'OROUS.

SANGUINOLENT, a. *săng-gwĭn'ō-lĕnt* [F.—from L. *sanguinolen'tus*, full of blood—from *sanguis* or *sanguĭnem*, blood]: mingled with blood; tinged with blood.

SANGUISORBACEÆ, *săng-gwĭ-sawr-bā'sē-ē*, or SANGUISORBEÆ, *săng-gwĭ-sawr'bē-ē:* according to some botanists, a nat. order of plants; but more generally regarded as a sub-order of ROSACEÆ (q.v.). As a sub-order, its distinctive characters are apetalous flowers—the tube of the calyx thickened, indurated, and lined with a disk, generally few stamens, and a solitary carpel, which ripens into a nut inclosed in the calycine tube. About 150 species are known, all herbaceous or half-shrubby, some of them spiny.—The leaves of *Acæna sanguisorba*, native of Van Diemen's Land, are said to be an excellent substitute for tea.—*Sanguisorba Canadensis*, Wild Burnet, is described by Gray under the name *Poterium Canadense*, the genus including *P. sanguisorba*, Garden or Salad Burnet.—See BURNET: LADY'S MANTLE (under LADY).

SANGUISUGE, n. *săng'gwĭ-sūj* [L. *sanguĭsūga*, a leech—from *sanguis*, blood; *sūgĕrĕ*, to suck]: the bloodsucker, a leech.

SANHEDRIM, n. *săn'ĕ-drĭm*, or SAN'HEDRIN, *-drĭn* [late Heb. *sanhedrin*—from Gr. *suned'riŏn*, a council—from Gr. *sun*, together; *hedra*, a seat]: great national judicial council among the ancient Jews; established at the time of the Maccabees, probably under John Hyrcan. It consisted of 71 members, presided over by the Nasi (Prince), at whose side stood the Ab-Beth-Din (Father of the Tribunal). Its members belonged to the different classes of society: there were priests (*Archiereis*); elders, that is, heads of families, men of age and experience (*Presbyteroi*); scribes, or doctors of the law (*Grammateis*); and others, exalted by eminent learning—the sole condition for admission into this assembly. The presidentship was con-

ferred on the high-priest in preference, if he happened to possess the requisite qualities of eminence; otherwise, 'he who excels all others in wisdom' was appointed, irrespective of his station. The limits of its jurisdiction are not known with certainty; but there is no doubt that the supreme decision over life and death, the ordeal of a suspected wife, and the like criminal matters, were exclusively in its hands. Besides this, however, the regulation of the sacred times and seasons, and many matters connected with the *cultus* in general, except the sacerdotal part, which was regulated by a special court of priests, were vested in it. It fixed the beginnings of the new moons; intercalated the years, when necessary; watched over the purity of the priestly families, by carefully examining the pedigrees of those priests born out of Palestine, so that none born from a suspicious or ill-famed mother should be admitted to the sacred service; and the like. By degrees, the whole internal administration of the commonwealth was vested in this body, and it became necessary to establish minor courts, similarly composed, all over the country, and at Jerusalem itself. Thus, we hear of two inferior tribunals at Jerusalem, each consisting of 23 men, and others consisting of three men only. These courts of 23 men (lesser Synedrion), however, as well as those of the three men, about both of which Josephus is silent, probably represent only smaller or larger committees chosen from the general body. Excluded from the office of judge were those born in adultery; men born of non-Israelitish parents; gamblers; usurers; those who sold fruit grown in the sabbatical year; and, in single cases, near relatives. All these were excluded also as witnesses. Two scribes were always present, one registering the condemnatory, the other the exculpatory votes. The mode of procedure was exceedingly complicated; and such was the caution of the court, especially in matters of life and death, that capital punishment was pronounced in the rarest instances only. The Nasi had supreme direction of the court, and convoked it when necessary. He sat at the head, and at his right hand was the seat of the Ab-Beth-Din; the rest of the 71 took their places according to their dignity, in front of them, in form of a semicircle, so that they could be seen by both the chief officers. The lictors, or 'sheriffs,' were always present at the session. The court met on extraordinary occasions in the house of the high priest; its general place of assembly, however, was a certain hall (*Lishcat Hagaziz*), probably at the s.e. corner of one of the courts of the temple. Except on Sabbath and feast days, it met daily. The political troubles forced the S. (B.C. 70) to change its abode to certain bazaars (*Hannyoth*) at the foot of the temple mount. After the destruction of the temple and Jerusalem, it finally established itself, after many further emigrations, in Babylon.

We cannot here enter into that most difficult question as to the origin and development of the S., and how far it was intended primarily to be a faithful reproduction of the Mosaic assembly of the 70 (Moses himself making 71),

supposed to have been re-established by Ezra after the Exile; any more than we can examine in this place into the widely different opinions respecting the jurisdiction and competence of the Sanhedrim at the time of Christ and the apostles; how far, in fact, it may be said to have existed at all—except for a few matters of small importance—curtailed and circumscribed as it was by the Romans, who seem to have recognized only the 'high-priest'; and that collateral but vital question, whether it was the Sanhedrim at all from whom emanated the well-known acts recorded in the New Test. There can be no question as to its utter incompetence to arraign Christ for a 'crimen læsæ majestatis,' i.e., for high treason against the Roman emperor. No less difficult is the explanation of many of the proceedings against the apostles ascribed to this body. The suggestion that the word Synedrion, as used in the New Test., stands only for an arbitrarily convoked 'lynch-tribunal,' deserves more consideration than it has hitherto received.

SANHEDRIN, FRENCH: Jewish tribunal called by Napoleon I., 1807, Feb. 9, to give due sanction to the views expressed by the assembly of notables, representative Jews, to the twelve questions submitted to it by the French government. These include the relations of Jews to divorce, polygamy, and intermarriage with Christians, patriotism, rabbinical jurisdiction, usury, and conduct to non-Israelites. The Sanhedrin was composed of 71 members, after the example of the old Sanhedrin in Jerusalem, two-thirds rabbis and the others laymen. Invitations were sent in Hebrew, German, French and Italian to all the Jewish communities of Europe to send delegates. The opening service was held in the synagogue, when the assembly was convened at the Hotel de Ville, the members being seated in a semicircle, the laymen behind the rabbis. David Sinzheim, chief rabbi of Strasburg, presided. The decisions of the Sanhedrin were that polygamy was forbidden to Israelites, that divorce by the Jewish law is valid only after the civil decree, that civil contract must precede marriage, that marriages between Jews and Christians are binding, although they cannot be celebrated with religious forms, that every Jew is taught to love and honor his non-Jewish fellow citizens as if they were Israelites, that a Jew regards the land of his birth or adoption as his country to love and defend, that no handicraft or trade is forbidden by Jewish law, that agriculture, manual labor and the arts are commendable to Jews, as of old; that finally Israelites are forbidden to take usury from Christian or Jew.

SANHITÂ, *săn'hĭ-tâ:* that portion of the Vedas which contains the Mantras or hymns. See VEDA.

SANICLE, n. *săn'ĭ-kl* [F. *sanicle*, sanicle—from L. *sano*, I heal]: a plant called self-heal; *Sanic'ŭla Europæa*, ord. *Umbellif'ĕræ.*

SANIDINE, n. *săn'ĭ-dĭn:* a variety of orthoclase felspar, occurring in transparent crystals.

SANIES, n. *sā'nĭ-ēz* [L. *sanĭēs,* diseased or corrupted blood: It. and F. *sanie*]: a thin reddish discharge from wounds or sores. SA'NIOUS, a. *-ŭs,* pertaining to sanies.

SAN ISIDRO: Philippines; pueblo, capital of the province of Nueva Ecija, on the Grande de la Pampanga river. It is a well-built town, at the intersection of several main highways which connect it with Manila, with several points on the Manila & Dagupan railroad, and with other important towns. It is in a fertile agricultural region and has a considerable trade. Pop. 9,480. There are two smaller pueblos of the same name: (1) pueblo, province of Pangasinán, Luzon, 6 m. w. of Lingayén, on the main highway; pop. 2,530; (2) pueblo, province of Zambales, Luzon, 50 m. n. of Iba, on the main road; pop. 2,870.

SANITARY, a. *săn'ĭ-tĕr-ĭ* [L. *sānĭtas,* healthy state or condition—from *sānus,* sound]: pertaining to measures for preserving health; tending to promote health (see SANATORY, under SANABLE)—both are often used indifferently, but improperly. SAN'ITA'RIUM, n. *-tā'rĭ-ŭm,* an erroneous spelling of SANATORIUM, a hospital or retreat for convalescents; a health station. See SANATORIUM, under SANABLE. SANITARY ENGINEERING, the branch of civil engineering which relates to structures and operations for promoting and guarding the health of communities. It deals with the means of providing cities and towns with pure and wholesome water, with the means for the removal in underground channels of the spent water supply called sewage, as well as of such ground water and rain water as may be necessary, with the means of removing the various waste products and refuse by cartage, such as garbage, ashes, and street sweepings. It also deals with the subjects of ventilation, water supply, sewerage, drainage, water purification, sewage, and refuse disposal and street cleaning. In other words, sanitary engineering embraces the design and construction of all works contributing to public health and comfort, and all means of preventing offensive conditions due to a large number of persons living closely together, as in cities or towns. With the rapid advance of practical knowledge, the profession of sanitary engineering, while resting upon the same foundations as civil engineering, has in recent years gradually called for an increased practical knowledge of vital statistics, of chemistry and biology as applied to its special branches. It is not necessary for the sanitary engineer to be a trained analyst, or accomplished in the details of state medicine, but he should be in touch with the general progress in these subjects, if his work is to be on the highest plane of excellence. SANITY. See under SANE.

SANITARY COMMISSION.

SANITARY COMMISSION, UNITED STATES: organization effected 1861, June 12, during the civil war, under an order of the U. S. war dept., with the title, 'A Commission of Inquiry and Advice in respect of the Sanitary Interests of the U. S. Forces.' Its earlier work was that of inspection of the dangers, wants, and deficiencies of each regt., camp, and hospital, and of securing prompt and efficient action of the military and medical authorities on behalf of the health, comfort, and life of the soldiers in the field. After the first six months, its plans extended to devising and executing a general system for gathering throughout the loyal states, and applying to the relief and comfort of the army, a great variety of contributions, supplementary to the usual army supplies. 1861, June 27—1866, Jan. 1, the receipts of the S. C. were $4,924,048.99, and disbursements the same. The estimated value of supplies given from the people to the S. C. was $15,000,000. The item of 'expenses' stood at $362,153.29. The 21 persons who served on the board gave their service gratuitously. The number of agents employed at different periods, at an average pay of only $2 per day, was from 150 to 700. The special inspection of hospitals, the choice and care of camps removal and care of the wounded after a battle, formation and administration of convalescent camps, keeping of hospital directories and answering inquiries for soldiers wounded or missing, providing soldiers' homes and specially supplying shelter and food, collecting soldiers' pay, and conducting a bureau of vital statistics, were important features of the work of the S. C., in addition to its immense gathering of supplies and money, and its system of independent transportation, which were of vast service to the govt. and the country. No army had ever before received such aid on a large scale and during a series of great campaigns. No account was ever taken of the receipts of branch treasuries, with which thousands of local organizations were affiliated, but the aggregate of these was at the very least $2,000,000 in money, while the grand total of the popular gifts to the army probably exceeded the mere receipts of the S. C. treasury by $25,000,000. During the war the board held 23 sessions, most of them in Washington. To facilitate action, a standing committee of five was invested with authority to represent the board. The members of this were: the pres. of the S. C., the Rev. Dr. H. W. Bellows, Dr. W. H. Van Buren, Prof. Wolcott Gibbs, Mr. Geo. T. Strong, and Dr. C. R. Agnew. To these was added, 1864, Oct., Mr. C. J. Stillé, who later prepared the official history of the work of the S. C., published 1866 Phila. The chief executive officer of the S.C. was the gen. sec., Frederick Law Olmsted, serving 1861, June 20—1863, Sep.; and after him Dr. J. Foster Jenkins, to the spring of 1865, when John S. Blatchford succeeded, and brought to a final settlement the complicated affairs of the organization. Two associate secretaries were employed, with headquarters at Washington and Louisville. The entire collection of records, papers, etc., of the S. C. are preserved in the Astor Library, New York.

SAN'ITARY SCIENCE, known also under the names PREVENTIVE MEDICINE, STATE MEDICINE, HYGIENE, and PUBLIC HEALTH: defined as 'an application of the laws of physiology and general pathology to the maintenance of the health and life of communities, by means of those agencies which are in common and constant use.' This department of science received so strong an impulse in England from the labors of Southwood Smith, Edwin Chadwick, Lyon Playfair, and others, that many persons regard it (and not entirely without reason) as of modern origin; but the health of the general population was a subject of legislation in the Mosaic code—the most ancient on record. That code contains minute directions for cleanliness of the person, purification of the dwelling and the camp, selection of healthful and avoidance of unwholesome food (pork, e.g., which in hot countries is more commonly found to harbor parasites than in temperate climates, and blood, which is the most putrescible part of the animal), seclusion of persons with contagious disorders, and various other points bearing on the physical well-being of the Jewish nation. The Greeks and Romans, though not, like the Jews, making hygiene a part of their religious duties, were far from neglecting it. 'The Laws of Lycurgus,' says Dr Gairdner, 'are not wanting in very pointed enactments on sanitary matters; and the importance attached by all the Greek republics, and in the Platonic ideal polity, to physical culture, is too well known to require remark. The Roman people, poor and apparently rude as it was in its origin, yet found time, amid its military occupations, to construct the *Cloaca Maxima* (q.v.) as an indestructible and stupendous memorial of its attention to the drainage and sewerage of the city at a very early period of its history. At a later period, aqueducts were made to cover miles upon miles of the surrounding plain; and their splendid ruins, still partly used for their original purpose, attest the munificence and the abundance with which the first of sanitary requisites was supplied to the imperial city.'—*Public Health in Relation to Air and Water*, 1862, p. 6. Moreover, we know enough of the construction of the private houses and public buildings of the Romans to see that they recognized the necessity for free ventilation and good drainage. When the *Archiatri populares*, or state-physicians, were first appointed in the Roman Empire, is not known. Their mode of election is described in the Theodosian and Justinian codes. There were ten in the largest towns; one to each district or subdivision; seven in towns of the second order; five in the smaller ones. They collectively formed a college, whose duty it was to attend to the public health; and they may be regarded as the earliest type of our Boards of Health. Gradually, however, as Christanity spread, an utter misconception of doctrine led to neglect of care of the human body. While the monks and friars devoted themselves to good works, feeding the hungry, clothing the naked, and instituting hospitals, they entertained no idea of the possible prevention of disease. They never attempted to im-

press on their followers the importance of drainage, ventilation, pure and abundant water, etc., but when an epidemic arose, it was supposed to be a manifestation of God's special anger; and it would have been impossible to make them understand that it was the natural result of a prolonged disregard of the laws of nature. Those who have read Dean Stanley's graphic *Memorials of Thomas A'Becket* will be inclined to wonder whether those who adopted such penances as his could ever be free from cutaneous disorders. As to the state of the towns in England in the 13th c., see Brewer's Introduction to *Monumenta Franciscana*, or a quotation from it in Dr. Gairdner's volume *Air and Water* 44–47. In another work in the same series, *Liber Albus*, is much important information regarding the general sanitary state of London in the mediæval times. In addition to the causes of disease indicated by these writers, such as the absence of drainage, the accumulation of filth, bad ventilation, insufficient and often unwholesome water, inattention to personal cleanliness, etc., must be noticed also the ordinary food in those times. The common vegetables of our own day, excepting the cabbage, were only slowly introduced from the time of Henry VIII. As turnips were not then used as a winter-food for oxen and sheep, these animals were with difficulty kept alive during the season when grass was scanty, and were therefore killed and salted in the beginning of the cold weather; and during several months, game and river-fish were the only fresh animal food. Macaulay, in his celebrated third chapter on 'The State of England in 1685,' observes that, at that time, meat, though cheaper than in former times, was still so dear that hundreds of thousands of families scarcely knew the taste of it; that bread such as is now given to the inmates of work-houses was then seldom seen even on the trencher of a yeoman or of a shopkeeper; and that the great majority of the natives lived almost entirely on rye, barley, and oats. See also Froude's *History of England*.

During the 18th c., important steps were taken for improvement of public health. Under a proper system of drainage, ague became eradicated from extensive fenny districts; and with a knowledge of the therapeutic properties of cinchona bark and arsenic, the disease may be cut short when it appears. Scurvy, still occasionally following a neglect of dietetic precautions, was nearly blotted out of the list of diseases fatal to sailors; and vaccination, incomparably the greatest discovery in this department of science, was the crowning achievement of the century. And yet, in consequence of vaccination being either neglected or imperfectly performed, the mortality 1871–80 in Great Britain was 236 per million, as against 163 per million in the preceding decennial period. See Sir J. Y. Simpson's *Proposal to Stamp out Small-Pox*. The first outbreak of cholera in Britain 1832, lamentable as it was, was productive of benefit in directing the public mind to the prevention or repression of disease. It was impossible to ignore the fact that, while the poor, dwelling in

unventilated and undrained hovels, fell victims in thousands to this new and ill-understood disease, the middle and higher classes were comparatively safe. All investigations into the dwellings and domestic habits of the lowest class of the population revealed a condition of things of which the general public had no conception. The result was a new poor-law (1834), with commissions of investigation and their successive reports. Dr. William Farr, with painstaking labor, reduced the whole confused subject to a science. By his system of calculating death rates, he placed an easy and useful method at the service of his professional brethren; while, by the formation of life-tables, he greatly facilitated the operations of life insurance. From this beginning sanitation has made great progress in Britain. The national gain from the decrease in the death-rate was strikingly put in a supplement to the Registrar-general's Report for England 1885, and reviewing the period 1871–80: 'The changes in the death-rates have given to the community an annual addition of one million eight hundred and forty-seven years of life shared among its members; and allowing that the changes in the death-rate are the direct consequence of sanitary interference, we must regard this addition of nearly two million years of life as an annual income derived from money invested in sanitation.' Further, see Annual Reports of the Local Govt. Board; and for an account of English sanitary machinery and administration, see the work on *Local Government*, by M. D. Chalmers, 1883.

We pass to consider the most important sanitary agents, beginning with Air. Under this head, we have to consider (1) the amount of air necessary for the full performance of the respiratory process; (2) the means of ascertaining when air is impure, or, if impure, what substances are mixed with it; (3) the means of purifying contaminated air; (4) the diseases due to deficiency in the quantity, and alterations in the quality of the air.

(1) The *first* question can be answered both by calculation and by experiment. The earlier observers fixed the requisite quantity of fresh air far too low; e.g., Arago at 353 cubic ft. per hour for a person. By calculation, Dr. Parkes finds that 2,082 cubic ft. of air must be supplied per head per hour, so to dilute the products of respiration and transpiration from the sound body, as to keep the air always pure and fresh (see his *Manual of Practical Hygiene*, 1864, p. 65). From numerous experiments in which the outflow of air was measured, and the carbonic acid simultaneously determined, he found that at least 2,000 cubic ft. per hour must be given to keep the carbonic acid at its normal level of ·5 or ·6 in 1,000 volumes, and to remove the *odor humanus* or fetid smell of animal matter. Gen. Morin (see *Rapport de la Commission sur le Chauffage et la Ventilation des Bâtimens du Palais de Justice*, 1860) gives results in close accordance with those of Parkes, assigning the following as the relative hourly amounts of fresh air (in cubic ft.) per head in temperate climates: in barracks, 1,059 by day, 2,118 by night; in workshops, prisons,

and theatres, 2,118; in schools; 1,059; in hospitals, 2,825, increased to 4,236 during the hours of dressing the surgical cases, and 5,650 during epidemics. In mines, if it is wished to keep up the greatest energies of the men, 6,000 ft. of air per hour must be allowed. A horse requires at least 2,460 ft. per hour. It is difficult to lay down any rules regarding the amount of fresh air required in sickness. Vitiation of the air by the products of combustion of gas, candles, lamps, etc., must not be overlooked. According to Dr. Parkes, for every cubic ft. of gas burned, 1,800 cubic ft. of air are required to keep the air pure, unless the gaseous products are carried off in a special channel attached to the gas-fittings. A pound of oil burned in a lamp may be regarded as equivalent to 10 cubic ft. of gas, so far as the deterioriation of the air is concerned.

(2) For the composition of pure air, see ATMOSPHERE. The impurities in air may be divided into: (*a*) suspended matters, (*b*) gaseous substances, (*c*) special impurities. Among *suspended matters* are, according to Pasteur and others, numerous and universal germs of organic beings, animal and vegetable, e.g., of vibriones, bacteria, and monads; pollen, spores of fungi, mycoderms, mucedones, etc. Minute particles of finely comminuted inorganic matter also are often taken up by currents of air, and remain in suspension: these are probably harmless The works of man more seriously affect the air in a hygienic view. Particles of coal and of half-burned carbon (smuts), starch-cells (from bakeries and bread), and, from certain industries, cotton fibres, particles of wool, of stone, of iron, etc., may, when constantly inhaled, produce special diseases of the lungs and stomach. In the air of badly kept hospital wards, pus-cells and epithelial cells are often detected. Most physicians now believe that the specific poisons of small-pox, scarlet fever, and measles, derived from the skin and mucous membrane, consist of molecular organic matter, which, though as yet undetected, must pass into the air; and the same remark applies to the so-called germs of typhoid fever (see TYPHUS AND TYPHOID FEVERS) and of cholera, which are thrown off by the intestinal mucous membrane, and subsequently become dried and capable of aerial suspension. Among *gaseous matters*, which merely pass into the atmosphere either from natural causes or manufactories, are various compounds of carbon, sulphur, chlorine, nitrogen, and phosphorus, with oxygen and hydrogen. Besides the gases formed by union of the above named elements, we must notice organic vapor from decomposing animal matters and sewers, which last has been found by Odling to be carbo-ammoniacal. Among *special impurities*, those caused by respiration are most important. An adult man, under ordinary conditions, gives off, in 24 hours, 12 to 16 cubic ft. of carbonic acid by the lungs; and a certain additional quantity, not determined, by the skin. Watery vapor, 25 to 40 ounces, also passes off daily from the skin and lungs, with an undetermined quantity of organic matter, partly suspended (as particles of epithelium, etc.)

and partly made up of organic vapor. This vapor, when collected and condensed from a large volume of respired air, is found to be nitrogenous, and has a very fetid smell. Numerous chemical analyses have been made of this most powerful source of vitiation (see Parkes, work above cited, 70–77; Gairdner, above cited, 69; Mapother's *Lectures on Public Health*, 2d ed., 40–61). There is a condition of the atmosphere to which various observers, especially Pasteur, have directed attention, which may be termed the fermentative condition, and depends on the universal presence in the air of countless germs of vegetables and infusoria, and doubtless is concerned in some of the zymotic diseases. The presence of a *cholera-fungus*, proved to exist in evacuations of all cholera patients, gave indication of the probable cause of that disease. Davaine taught that the splenic apoplexy of sheep is owing to the presence of bacteria in the blood; and that sheep, rabbits, and horses can be inoculated by transferring into their circulation the bacteria, which are extremely small rod-like organisms. The same observer found that bacteria are to be found in all carbuncular diseases of any form whatever; that the supervention of these little beings in the spleen, the lungs, and the blood, precedes the occurrence of morbid phenomena; and that the carbuncular blood ceases to be contagious as soon as the bacteria have disappeared. Another French observer, Poulet, detected myriads of infusoria in the breath exhaled in whooping-cough. Dr. Klein in *Micro-organisms and Disease* (1884) affirmed that the pathogenic influence of micro-organisms had been proved in the case of erysipelas, gonorrhea, malignant pustule, etc.—See GERM THEORY OF DISEASE: KOCH, ROBERT: PASTEUR, LOUIS.

(3) The natural means of purifying the atmosphere are diffusion, oxidation, action of winds, and fall of rain. Where the air is specially impure, as in sick-rooms where there are contagious cases, the agents commonly known as *Disinfectants* (q.v.), or *deodorants*, are employed. Among the *solids* of this class are charcoal (see WOOD-CHARCOAL), dried earth, and the carbolates of lime and magnesia. Among the *liquids*, those in highest reputation are *Condy's Fluid* (consisting of an alkaline permanganate, which at once decomposes ammoniacal compounds, and destroys organic matter rapidly) and carbolic acid: while among the *gases* or *vapors*—the most powerful means of purifying the atmosphere, next to ventilation—are, in especial, chlorine, nitrous acid, and sulphurous acid; of these, says Dr. Parkes, the nitrous acid is probably the most powerful, but it is useful to employ all three alternately, or even together. See DISINFECT. Yet all these agents are mere auxiliaries to ventilation, whose primary importance must never be forgotten.

(4) Abundant experience confirms the inference from the physiology of Respiration (q.v.), that the breathing of impure air is incompatible with health. The special impurities noticeable as causes of disease, or of impaired health, are arranged by Dr. Parkes as follows: (*a*) Suspended

matters, (*b*) Gaseous matters; (*c*) Impurities from several substances always co-existing.

(*a*) *The suspended matters* known to occasion disease in various industries, are very numerous. Thackrah, in *The Effects of Arts, Trades, and Professions on Health* (1832) gives the following list of workmen who were injuriously affected by the dust of their trades: Corn-millers, maltsters, tea-men, coffee-roasters, snuff-makers, paper-makers, flock-dressers, feather-dressers, shoddy-grinders, weavers of coverlets, weavers of harding, dressers of hair, hatters employed in the bowing department, dressers of colored leather, workers in flax, dressers of hemp, some workers in wood, ware-grinders, masons, colliers, iron-miners, lead-miners, grinders of metals, file-cutters, machine-makers, makers of firearms, and button-makers. Colliers in ill ventilated mines suffer from lung disease; and to the list above must be added potters, especially the *flat-pressers*, in whom emphysema is so common that it is known as 'the potters' asthma;' china-scourers, who ail, sooner or later, become asthmatical from inhaling the light flint-dust in suspension; pearl button-makers and pin-pointers, who suffer from bronchitis, and hæmoptysis; makers of grinding-stones and of Portland cement, etc. In some manufactures irritant vapors are more or less associated with suspended particles in causing disease. Brass-founders suffer not only bronchitis and asthma from the inhaled dust, but also a special disease, described by Dr. Greenhow (*Proceedings of the Medico-Chirurg. Soc.*, IV.) as Brassfounders' Ague, produced apparently by inhalation of the fumes of oxide of zinc; the symptoms being oppression of the chest, with indefinite nervous sensations, followed by shivering, a hot stage, and profuse sweating. Coppersmiths and tin-plate workers are liable to somewhat similar attacks. Plumbers, house-painters, manufacturers of white-lead, etc., are, as is well known, liable to lead-poisoning. For the peculiar affection, *Mercurial Tremor* or the *Trembles*, to which workers in mercury and its amalgams, as silverers and water-gilders, are exposed, see PARALYSIS. In industries in which arsenical compounds are employed, e.g., making artificial flowers, green paper for walls, etc., preparing arsenical pigments, etc., the well-known symptoms of chronic arsenical poisoning are likely to ensue.

Passing from inorganic or unorganized matter to organic substances floating in the atmosphere, and giving rise to a large class of important diseases, we remark, that it remains to be decided in what exact condition this organic matter exists—whether in the form of impalpable particles, or moist or dry epithelial or pus cells; 'and whether it is always contained in the substances discharged or thrown off from the body (as is certainly the case in small-pox), or is produced by putrefactive changes in these discharges, as is supposed to be the case in cholera and dysentery, is also a matter of doubt. But, from the way in which, in many cases, the organic substance is absorbed by hygroscopic substances, it appears that it is often combined, or at any rate condensed, with the water of the atmosphere.'—

Parkes, as above, 86. This is known regarding the specific poisons—viz., that they differ extremely in the readiness with which they are oxidized and rendered harmless. While typhus and oriental plague throw off a poison, which, if there is due ventilation, is readily destroyed, the poisons of small-pox and scarlatina spread in defiance of free ventilation, and retain their virulence for weeks or months.

(*b*) The most important *gaseous matters* in the air likely to produce disease are *carbonic acid* (carbon dioxide, CO_2) and *carbonic oxide* (carbon monoxide, CO). The normal quantity of carbonic acid in the air being regarded as ·5 in 1,000 volumes, 'it produces fatal results when the amount reaches 50 per 1,000 volumes; and at an amount much below this, 15 or 20 per 1,000, it produces in some persons, at any rate, severe headache.' Dr. de Chaumont, assistant prof. of hygiene at Netley, has published extended formulæ for calculating most of the problems connected with ventilation. Among his most important conclusions are the following: (1) We cannot safely accept a lower standard of purity than ·06 per cent. of carbonic acid. (2) Uniform diffusions being supposed, we cannot preserve this standard with less delivery of fresh air than 3,000 cubic ft. per head per hour. (3) We must provide an air space which will admit the delivery of 3.000 cubic ft. per head, and at the same time preclude the necessity of changing the whole air so often as six times per hour, for which condition a minimum of 1,000 cubic ft. is absolutely necessary. *Carbonic Oxide* (q.v.), often developed in association with carbonic acid, is far more actively poisonous than carbonic acid. An atmosphere containing ½ per cent. killed small birds in three minutes; and when 1 per cent. was present, they died in half this time (Letheby). For the effect of other gaseous matters, as sulphureted hydrogen, carbureted hydrogen, sulphurous acid gas, hydrochloric acid gas, etc., see any of the more elaborate works on this subject.

(*c*) The *impurities from several co-existing agents* next claim attention. In fact, these are the impurities with which we have practically almost always to deal. When air is vitiated by respiration, it is popularly believed that the carbonic acid gas is the chief poisonous agent; and that the fatality in such well-known cases as the Black Hole (q.v.) of Calcutta, the prison in which the Austrians were placed after the battle of Austerlitz, etc., is due simply to the action of this gas. The true poisonous agencies in these instances are the organic matter always found in air rendered fetid by the prolonged respiration and cutaneous exalation of a crowd of human beings, and the deficiency of the oxidation, and the consequent increase of putrescent matter in the body (see Carpenter's *Human Physiology*, 1864, p. 304). Putting aside these extreme cases, which are rare, we have abundant evidence that the continuous inhalation of an atmosphere moderately vitiated from respiration is injurious: the aëration of the blood is imperfectly effected, and the nutrition generally is more or

less interfered with. Although air contaminated by respiration has long been vaguely regarded as a cause of phthisis, and other lung troubles, during the 19th c the fact has been placed on unquestionable authority. In the Brit. army phthisis formerly prevailed in the most varied stations, and in the most beautiful climates: in Gibraltar, Malta, Ionia, Jamaica, Trinidad, Bermuda, etc., in all which places the only common condition was the vitiated atmosphere of the barracks. Since the air has been made more pure there has been a most decided decline in phthisical cases in these stations. Evidence is added by comparative pathology. The extraordinary mortality by phthisis among the inhabitants of the old monkey-house in the Zoological Gardens, London, was found to be due to overcrowding and bad ventilation: in their present airy residence, the animals no longer die prematurely. The overcrowding of cows in large towns leads to the ravage by pulmonary disease among these animals; while horses, which in the worst stables have more free air than cows, rarely suffer. Air vitiated by organic exhalations seems to favor the spread of several well-known specific diseases, also; e.g., typhus, plague, small-pox, scarlatina, and measles.

Hitherto, we have considered the effect of breathing an atmosphere vitiated merely by exhalations from persons in ordinary health. In the air of a crowded hospital-ward, the organic matter is not only more abundant, but also far more noxious; and the convalescence of patients is much retarded by such an atmosphere (see CONVALESCENT HOSPITAL). When the air has absorbed a certain amount of organic impurity, its respiration is very liable to give rise to erysipelas and hospital gangrene. *Sewers* and old *cesspools*, when opened, give off *sewage-gas* containing carbonic acid, sulphureted hydrogen, sulphide of ammonium, and putrid organic vapor. Typhoid and diarrhea are commonly induced by escape of sewer-gas through drains and water-closets into houses. Hence, the indispensableness of most careful scientific plumbing. The effects of the impurities arising from manufactories of various kinds, are of course extremely varied; and can here be only glanced at. Sulphurous and sulphuric acid are given off from vitriol and copper-smelting works; hydrochloric acid from alkali works; arsenical fumes and sulphurous acid from copper and lead smelting furnaces, carbonic acid and carbonic oxide from cement-works, etc. Soap and candle manufactories, if not well superintended, yield various gases of rancid smell, and even that powerful irritant, acroleine. Gas-works in which the wet-lime process of purification is adopted, often evolve sulphureted hydrogen to a degree injurious to health. The *air of old graveyards*, when they are disturbed, often occasions epidemics of fever; but the effect of the effluvia of comparatively recent putrefying human bodies is much more decided. How far the effluvia arising from *slaughter-houses* and *knackeries* are injurious to health, is an open question; except that when putrid matters are allowed to remain, disease is

known to result. Malaria from *marshes* occasions not only intermittent and remittent fevers, but also diarrhœa and pure dysentery. Organic matter to the amount of eight grains has been obtained from 1,000 cubic ft. of air collected over marshes; and it has just the same chemical characters as the organic matter exhaled from the lungs, turning red with nitrate of silver, yielding ammonia when treated with lime, and blackening sulphuric acid when drawn through it. See Mapother, above cited, 87.

The next point to be considered is the means to be adopted for continually changing the air, so as to keep its natural purity. We have already shown that this change must amount to at least 2,000 cubic ft. per head per hour for persons in health; and sometimes double that amount, or more, for sick persons. For the general principles of ventilation, see WARMING AND VENTILATION: we confine ourselves here to a few supplementary observations concerning the supply of fresh air. The following is from Dr. Parkes (cited above) p. 103. (1) 'The *entering air* must itself be pure. It must be warmed if too cold, and cooled if too warm. (2) Its movement should be imperceptible, otherwise it will cause the sensation of draught, and will chill. The rate at which the movement becomes imperceptible is 1½ ft. per second, or 1·36 m. per hour; 2 and 2½ ft. per second, or 1·4 and 1·7 m. per hour, are imperceptible to some persons; 3 ft. per second, or 2 m. per hour, is perceptible to most; 3½ ft. is perceived by all persons. Any greater speed than this will give the sensation of draught, especially if the entering air be of a different temperature, or moist. (3) It must be well diffused all through the room, so that in every part a movement shall be going on—in other words, the distribution must be perfect. (4) The *outgoing air* must be removed so immediately that there shall be no risk of a person breathing again either his own expired air or that of any other person.'—The *action of the wind* is a powerful ventilating agent. If it can pass freely through a room with open doors and windows, it changes the air to an extent that can be effected in no other way. The most serious objection to winds as ventilating agents by perflation is the uncertainty of their movement, and the difficulty of its regulation. When the velocity reaches 4 m., it is found unpleasant by most people, and is therefore either excluded, or admitted only through small openings, so failing to be properly distributed. For the employment of wind in systems of ventilation, see Ritchie's *Treatise on Ventilation*, 1862; Tomlinson's *Treatise on Warming and Ventilation*. In ventilation of ships, the wind is always used, the air being directed between decks and into the hold by wind-sails or tubes with hoods turning toward the wind. In artificial ventilation by a fan or screw, it is a question which of the two methods should be employed—*extraction*, in which the air is drawn out of a building or room; or *propulsion*, in which air is driven in, to force out the air already in the room: both plans have advocates of authority. The advantages of propulsion are its certainty and the ease with

which the amount may be altered. The stream of air can be taken from any direction, and can be washed, cooled, or warmed at pleasure. See BLOWING-MACHINES. In some large buildings, the air is taken from the basement; is washed, by being drawn through a thin film of water thrown up by a fountain; is passed (in cold weather) into vessels for the purpose of warming it, in which it can be moistened by a steam-jet, if the difference of the dry and wet bulb be more than five degrees, and is then propelled along the channels which distribute it to the hall. In summer, it is cooled in the conduits by the evaporation of water. This plan has been successful in hospitals in the United States, England, and France.

For the best means of keeping the air of rooms at proper temperature, see WARMING. The degree of artificial warmth should vary according to circumstances. Healthy adults, well fed and clothed, may find a temperature of 60°, or even less, comfortable; while children and aged persons require 65° to 70° or even more. In hospitals, the proper temperature is usually supposed to be about 60°; but in diseases in which there is preternatural heat, except possibly in scarlatina, a lower temperature is often deemed expedient. In most febrile cases, in the acute stage, cold air, cautiously introduced, moving over the body is efficacious as a cooling agent.

The next sanitary element to be considered is WATER. The *daily quantity* of water for healthy and sick persons is the first point for consideration. Water is required by healthy persons (1) *For drinking.* A man weighing 140 lbs. will take on an average 70 to 90 ounces of water in 24 hours, of which 30 or 40 ounces are taken imperceptibly in the solid food, while the remaining 50 or 60 ounces are taken in liquids. But the amount varies extremely. The usual allowance on board ship for both drinking and cooking is 8 pints per adult daily. (2) *For cleaning the person, clothes, and habitations.* Dr. Parkes estimates 4 gallons per head daily as the smallest amount; and if perfect cleanliness is to be secured, and baths are taken, at least 16 gallons per head are required. A general bath requires about 50 gallons; a shower-bath at least 6 gallons; and a hip-bath 12 to 18 gallons. (3) *For sewage,* an additional 9 gallons per head daily must be added. The amount for a water closet varies with its construction.

It is well to know that a horse drinks 8 to 12 gallons daily, and ought to have 3 or 4 more for grooming purposes: a cow or small ox drinks 6 to 8 gallons; and a sheep or pig, 2 quarts to 1 gallon.

For the different *sources* of water—rain-water, rivers and springs; their impurities and the methods of detecting them; and the modes of purifying bad water, see WATER-SUPPLY. The *organic matters* in different waters used for drinking require additional remarks, on account of their extreme importance in a hygienic view. Organic matters vary in amount from 0·3 per gallon to 12 or even 30 grains per gallon, the purest waters in this respect being those from granitic, or clay-slate, or chalk districts. The most common

organic matter is from the vegetable kingdom, and consists of humin and ulmin, and of acids derived from humus; all which substances are non-nitrogenous, though the acids combine readily with ammonia. This form of organic matter is far less dangerous than that of animal origin and containing nitrogen. This organic matter is usually derived from the contents of cesspools or sewers percolating into springs, and sometimes from graveyards even at some distance. Its exact composition is not known. Fecal and biliary matters doubtless contribute to the composition of this matter; and in addition, decomposed flesh, as the refuse of butchers' shops and slaughter-houses—substances from type-manufactories and gut-spinners, from size, horn, and isinglass manufactories, etc., often contribute to the organic matter of well and spring water. Most of these substances, in decomposing, produce both nitrous and nitric acid, and ammonia; and the nitrites and nitrates thus formed unfortunately not only do not communicate any bad taste or smell to the water, but actually tend in many cases to render it palatable. The use of water of this kind is liable to produce diarrhea, and choleraic symptoms.

The characters of good drinking-water—as laid down after much discussion by various sanitary congresses—are summed up by Dr. Parkes as follows: 'It must be transparent, colorless, without odor, and tasteless; it should be well aërated (as it then appears to be more easily absorbed), cool, and pleasant to drink; it must have no deposit; vegetables should be readily cooked in it; the total dissolved constitutents must be within a certain amount, which, with some limitation, may be represented by the following numbers: organic matter should not exceed 1·5 grains per gallon; carbonate of lime, 16 grains; sulphate of lime, 3 grains; carbonate and sulphate of magnesia, 3 grains; chloride of sodium, 10 grains; carbonate of soda, 20 grains; sulphate of soda, 6 grains; and iron, 0·5 of a grain.' To the substances named in the article on WATER-SUPPLY, as purifying water from organic matter, we add the following: (1) *Permanganate of potash*, commonly known as Condy's Fluid, which decomposes organic matter and ammoniacal compounds by rapid oxidation. (2) *Strychnos potatorum*, used in India to purify water; the nut being rubbed on the inside of the casks. (3) Certain vegetables containing *tannin*, e.g., tea, kino, the Laurier rose (in Barbary), and bitter almonds (in Egypt). The water of the Peiho and other rivers in n. China is so impure and offensive during winter, that the Chinese never drink it except as tea, when it seems to lose all its bad effects.

The consequences of an *insufficient* and *impure* supply of water deserve the most serious consideration. An insufficient supply leads to the person and clothes not being washed at all, or being repeatedly washed in the same water; to water for cooking being repeatedly used; to imperfect cleansing of houses and streets; to the sewers becoming clogged, and the air thus rendered impure. The natural result is—as in the case of a deficiency of pure air—depressed condition of the general health, with tendency

to skin-diseases, ophthalmia, etc.; while the imperfect cleansing of the sewers favors the spread of typhoid fever and choleraic diarrhea. A continually increasing class of cases is found to be connected with the use of impure water; the principal noxious ingredients being animal organic matter, especially when of fecal origin; vegetable organic matters, when derived from marshes; and some salts, except when in very small quantities—e.g., sulphates of lime and magnesia, chlorides of calcium and magnesium, nitrates and nitrites of ammonia, etc. The *alimentary mucous membrane* is considered especially liable to be affected by impure water. Thus, dyspepsia, with such symptoms as partial loss of appetite, uneasiness or pain in the pit of the stomach, nausea and constipation, with occasional diarrhea, may be caused by water containing certain quantities (probably about eight grains each per gallon) of sulphate of lime, chloride of calcium, and the magnesian salts. *Diarrhea* may be caused by the use of many of the great N. Amer. rivers, the Ganges, etc., where much clay is held in suspension. Water contaminated with sewage, and containing suspended animal and especially fecal matter, is a common cause of an outbreak of this affection, and even of choleraic symptoms. Dissolved animal organic matters doubtless have similar effect, but it is difficult to distinguish between the actions of these and of suspended organic matters. Among other impurities known to occasion diarrhæa are fetid gases (sulphureted hydrogen), and excess of dissolved mineral matters and nitrate of lime; and on most persons, brackish water acts similarly. The effects which the selenitic well-waters of Paris exert on strangers are well known. There is abundant evidence to show that impure water is one of the principal causes of *Dysentery*. The records of army surgeons abound in illustrative cases.

In addition to diseases affecting the alimentary mucous membrane of the intestines, there are certain *specific diseases* which result from use of impure water; e.g., *Malarious Fevers* of various forms, from use of the water of marshes; *Typhoid Fever*, from water contaminated with sewage matters, or the special typhoid poison; *Cholera*, from water into which cholera-evacuations have made their way; and possibly *Yellow Fever*. (The relation of impure water to typhoid fever and cholera will be more fully noticed later in this article.) To the use of water unfit for drinking purposes are also ascribed epidemic boils from the presence of sulphureted hydrogen; disease of the bones, as exostosis, from an excess of carbonate and sulphate of lime; calculi (on, we think, insufficient evidence); goitre, from water derived from limestone and magnesian rocks; and entozoa of various kinds. Dr. Parkes (as above cited, p. 63) sums up the department of his *Manual* which treats of water in a hygienic view with the following: '(1) An endemic of diarrhea *in a community* is almost always owing either to impure air, impure water, or bad food. If it affects a number of persons suddenly, it is probably owing to one of the two last causes; and if it extends over many families,

almost certainly to water. (2) Diarrhea or dysentery constantly affecting a community, or returning periodically at certain times of the year, is far more likely to be produced by bad water than by any other cause. (3) A very sudden and localized outbreak of either typhoid fever or cholera is almost certainly owing to the introduction of the poison by water; and the same fact holds good in cases of malarious fever. (4) The presence of lumbrici, guinea-worm, or *Bothriocephalus latus*, should always excite suspicion of the drinking and bathing water.'

After the two most important factors in relation to health viz., air and water, SOIL and CLIMATE occupy a secondary, though important place. *Soil* may affect health (1) by its conformation and elevation. Thus, among hills, the unhealthful spots are inclosed valleys where the air must stagnate, and ravines. On plains, the most dangerous spots are at the foot of hills which store up water, unless a ravine cuts off the drainage. (2) Vegetation exerts an important influence. If we regard vegetation as divisible into herbage, brushwood, and trees, it may be laid down as a general rule, that herbage is always healthful, and in the tropics, is of great importance in cooling the ground, both by obstructing the sun's rays and by aiding evaporation; that brushwood is almost always bad, but that its removal may cause temporary increase of malarious disease, on account of the disturbance of the soil; and that trees should seldom be removed, unless they decidedly interfere with the movement of the air; for in cold countries they shelter from cold winds—in hot, they cool the ground—and in both they may afford protection from malarious currents. The present condition of St. Thomas in the W. Indies, now one of the most pestilent sites, is due mainly to the insane destruction of its trees. The island of Mauritius has suffered fearfully from fever from the same cause. (3) The mechanical structure of the soil is of hygienic importance. Thus, *heat* is very differently absorbed by different soils under the same conditions of exposure. Assuming that sand with a little lime has the maximum power of retaining heat, and that its capacity be represented by 100, then the capacity of clay will range from 76·9 to 66·7; while that of chalk will be 61·8, and that of humus as low as 49. Hence, we see the comparative coldness of the latter soils as compared with sand. The capacities of these soils for absorbing and retaining moisture are in the reverse order.

As a general rule, there appears the following connection between the geological characters of a site and its probable healthfulness. *Granitic*, *Metamorphic*, and *Trap Rocks* are usually healthful: there is generally a slope, so that water runs off readily, the air is dry, vegetation moderate, and drinking water generally good. They are, however, supposed to be unhealthful when they have become disintegrated, as at Hong-Kong, into a dark-colored soil. *Clay-slate Rocks* are regarded as healthful, for similar reasons: water, however, is often scarce. Of the varieties of *Limestone Rocks*, the hard oolite is the best, and the magnesian (which,

if possible, should always be rejected as a site) the worst. *Chalk*, unmixed with clay, forms a very healthful soil; but if it be mixed with clay, it loses its permeability, and is often damp and cold. The air is pure, and the water, though hard, is clear, sparkling and pleasant. The *Sandstones*, if permeable, are healthful; but if, from an admixture or underlying of clay, they lose this property, they are often damp. The water must be carefully examined. The hard millstone grits are very healthful. *Gravels* of any depth are healthful, unless water rises through them. Dr. Parkes considers gravel-hillocks as the most healthful of all sites, and the water as being very pure. *Clay, Dense Marls*, and *Alluvial Soils* must be regarded with suspicion. Such soils, especially the deltas of rivers, should be avoided as sites.

CLIMATE.—The most important climatic conditions connected with the air are *temperature, humidity*, and *movement, weight, and composition of the air*. Not entering into the general subject of acclimation, we remark that Americans and Europeans from temperate climates seem to thrive in countries not much hotter than their own; though it is yet too soon to decide whether the general vigor of the race will improve or diminish. In countries with a yearly mean of 20° F. higher than the home climate, as in many parts of India, the race seems to dwindle, and gives indications of dying out. The endemic diseases of North Americans and Europeans in the tropics are liver-disease and dysentery; but it is uncertain how far other influences besides heat may be at work in producing these diseases. Rapid changes of temperature are always dangerous. The sudden check to the free action of the skin caused by a cold wind, is almost sure to give rise to catarrh, inflammations, and neuralgia. In London, the registrar-general's returns show that when the temperature falls from 45° to 27°, the weekly mortality is increased by 400, bronchitis mainly causing this increase, though it is not usually fatal in more than about 40 cases weekly. For the fatal influence of extreme cold, see COLD. According to their humidity, climates are divided into *moist* and *dry*. The most agreeable amount of moisture to most persons is when the relative humidity is between 70 and 80 per cent. (By *relative humidity* we express comparative moisture; complete saturation being assumed to be 100. It is determined by dividing the weight of vapor actually existing in the air (or the absolute humidity) by the weight of vapor which would have been present if the air had been saturated). In chronic lung-diseases, a still moister air is most pleasant, and serves to allay cough. The morbid effects of undue moisture are always associated with rise of temperature. As a general rule, warmth and great humidity are less injurious than cold and great humidity. There seems a close relation between the spreading and the checking of certain epidemic diseases and the relative moisture of the

atmosphere. The malarious diseases are most intense when the moisture is excessive; while plague and small-pox are checked by a very dry atmosphere. Yellow fever seems unaffected by this atmospheric condition. The mere humidity of a climate, irrespective of other climatic relations, is deemed not injurious to life.

The *movement of the air* is another climatic condition of importance, but it must be considered in connection with heat and moisture. A cold wind abstracts the bodily heat in proportion to its velocity; while a hot wind, if dry, increases evaporation, and may thus partly neutralize its own heating power. Variations in atmospheric pressure are of greater importance in relation to health. 'In ascending mountains,' says Dr. Parkes 'there is rarefaction, i.e., lessened pressure of air, lowered temperature, and lessened moisture above 4,000 ft.; greater movement of the air; increased amount of light; greater sun-radiation, if clouds are absent; and the air is freer from germs of infusoria. Owing to the rarefaction of the air and watery vapor, there is greater diathermancy of the air; the soil is rapidly heated, but radiates also fast, hence very great coolness of the ground and of the air close to it at night.' The physiological effects of lessened pressure begin to be perceptible at somewhat less than 3,000 ft., at which altitude the mercury falls 3 inches. The pulse is quickened by 15 or 20 beats, and the breathing by 10 or 15 inspirations per minute; there is increased evaporation from the skin and lungs, while the urinary secretion is probably diminished. At an elevation of 6,000 or 7,000 ft., as in the Swiss Alps, the effect of the mountain air shows itself in marked improvement in digestion, sanguification, and in nervous and muscular vigor. At great heights, there is swelling of the superficial vessels, and occasional bleeding of the nose and lungs; and a sensation of weight is felt in the limbs from the lessened pressure on the joints. A residence for some time in a mountain-air is of great value in all anæmic affections, whatever their cause. Neuralgia, gout, and rheumatism are benefited by high alpine positions; and scrofula and consumption are almost absent in the true alpine regions, while patients affected with these diseases, if brought to such a climate, rapidly improve. On the other hand, pneumonia, pleurisy, and acute bronchitis are more common in high regions than lower down.

For the subject of Food, see Diet: Food and Drink. There are, however, certain points connected with it which obviously fall within the domain of hygiene; e.g., (1) quantity of different kinds of food required for persons of different sexes and ages, and under varying conditions of life and climate (see Diet); (2) determination of the best articles of food in each class, and whether they are in proper state for use. On diet, Pettenkofer and Voit (quoted in Parkes's *Sanitary Report of the Army* for 1865)

give statements showing that a strong average man requires, 5·22 oz. of dry nitrogenous matters, 3·63 oz. of fat, and 13·3 oz. of carbohydrates. They find also that when the food is sufficient, the daily excretion of carbon from the lungs is 8·92 oz. or 3,902 grains. We add that an average man, at moderate work, takes, in 24 hours, from $\frac{1}{26}$ to $\frac{1}{20}$ of his own weight in solid and liquid food—viz., 34 to 46 ounces of so-called solids, as bread, meat, etc.; and 50 to 80 ounces of water. The ratio of the solid to the liquid food is generally 1 to 2, but may be 1 to 6. Great bodily exercise requires greater increase of the solid than of the liquid food. The proper arrangement of diet for the sick is very difficult. In hospitals, fixed scales must, as a matter of convenience, be adopted; but almost every special case requires a modification. For further information on special diets, see various special works.

The diseases connected with food are so various that we can notice only the most important. Passing over those which arise from excess of food generally, or of one of its classes, with the remark, that prolonged excess of albuminates gives rise to congestion and enlargement of the liver, and a general plethora, while excess of starchy matters may possibly affect the muscular fibres of the heart and voluntary muscles, and certainly often renders the urine saccharine, we proceed to notice diseases produced by deficiency of food. The history of epidemic fevers in all ages and countries shows the close relation between famine and fever. In the *Irish famine* 1847–49 (three years) 579,721 cases were treated in the hospitals alone. Fleeing in despair, emigrants carried the germs of disease with them; and the so-called *ship-fever* which followed destroyed its thousands. In one vessel, 329 out of 349 passengers caught the fever, and 117 died; and the mortality in Liverpool, induced by the contagion of the fever-stricken Irish who landed there, suddenly became the highest ever recorded in any modern town—the death-rate being raised to 70 per 1,000. The opinion has been expressed by high authority that the use of the potato as an almost sole article of diet has done much harm, in consequence of the deficiency of that root in nitrogenous matters and in salts of lime and magnesia. To this source he traces indigestion, consumption, scrofula, rickets, ophthalmia, and chronic rheumatism. The deprivation of starchy food, on the other hand, can be borne for a long time if fat be given; but the simultaneous deprivation of fat and starch soon induces illness, though albuminates be supplied. The relative proportion of fat to albuminates in the food most easily digested, and at the same time producing the greatest mechanical force, is as 1 to 2; in the potato, it is as 0·1 to 1·5, or as 1 to 15. Further, the starchy matters should be to the nitrogenous as 3 to 1 in the best diet: in the potato, they are as 23·4 to 1·5, or as 14 to 1 nearly. See MUSCULAR FORCE, ORIGIN OF.

With regard to salt meat, it must be recollected that the brine, if it has been used several times, occasionally becomes poisonous. The evidence as to the power of diseased

meat, when eaten, to excite disease, is—except in cases in which entozoa are present—not conclusive. The occasional occurrence of a poison in sausages is well known. The fresh flesh of diseased animals assuredly causes injurious effects in many cases, but not in all. In the early stage of acute inflammatory disease, the meat is not altered, and may be eaten with impunity. The death of sheep from splenic apoplexy or braxy, and from small-pox, renders their flesh unfit for food; but the flesh of cattle destroyed by foot-and-mouth disease and by typhoid fever has been largely used in France without injury. See POISONS; PTOMAINES. As to adulteration of ordinary articles of food, see FOOD.

CLOTHING should preserve the proper heat of the body by protecting it both from cold and heat, and from the injurious action of sudden changes of temperature on the skin. The most important materials of clothing are cotton, linen, wool, silk, leather, and india-rubber. *Cotton*, as a material of dress, wears well, does not readily absorb water, and conducts heat much less rapidly than linen, but much more rapidly than wool. From the hardness of its fibres, its surface is slightly rough, and occasionally irritates a very delicate skin. Its main advantages are cheapness and durability. In merino it is mixed with wool in various proportions, and this admixture is far preferable to unmixed cotton. *Linen* is finer in its fibres than cotton, and hence is smoother. It possesses high conducting and small radiating powers, so that it feels cold to the skin; moreover, it attracts moisture much more than cotton. For these reasons, cottons and thin woolens are much preferred to linen garments in warm climates. *Silk* forms an excellent underclothing, but from its expense, it can never come into general use. *Wool* is superior both to cotton and linen in being a poor conductor of heat, and a great absorber of water, which penetrates into the fibres and distends them (hydroscopic water), and also lies between them (water of interposition). 'This property of hydroscopically absorbing water is,' as Dr. Parkes observes, 'a most important one. During perspiration, the evaporation from the surface of the body is necessary to reduce the heat which is generated by exercise. When the exercise is finished, the evaporation still goes on, and to such an extent as to chill the frame. When dry woolen clothing is put on after exertion, the vapor from the surface of the body is condensed on the wool, and gives out again the large amount of heat which had become latent when the water was vaporized. Therefore a woolen covering, from this cause alone, at once feels warm when used during sweating. In the case of cotton and linen, the perspiraton passes through them, and evaporates from the external surface without condensation; the loss of heat then continues. These facts make it plain why dry woolen clothes are so useful *after* exertion. In addition to this, the texture of wool is warmer, from its bad conducting power, and it is less easily penetrated by cold winds.'—*Leather* is used not only for shoes, boots, and

leggings, but, in cold windy countries, for coats. Leather and sheepskin coats are in common use in Turkey, Tartary, Persia, the Danubian Provinces, and in Canada, where buffalo-skins are often used. For persons specially susceptible to cold, and of delicate organization, a chamois leather jacket worn over or under a flannel waistcoat may be recommended during winter. *India-rubber* clothing must be used with extreme caution. From its being impenetrable to wind, and from its condensing and retaining the perspiration, it is decidedly objectionable; but on the other hand, its protection against rain is a very valuable property. For protection against heat, white is the best color, then gray, yellow, pink, blue, and black. The shape and weight of all articles of clothing should be such as to allow freest action of the limbs, and in no way to interfere by pressure with the processes of respiration, circulation, or digestion.

Attention to the STATE OF THE SKIN is of great importance in a hygienic view. The perspiration and sebaceous matters naturally poured out on the surface of the body, with an intermingling of particles of detached epidermis, fragments of fibres from the dress, dirt, etc., if not removed, gradually form a crust which soon materially interferes with the due excreting action of the skin. There is little doubt that the daily use of the matutinal *tub,* contributes materially to harden the system against attacks of colds, rheumatism, etc. When a tub and sponge are unattainable, a wet towel rubbed over the body, followed of course by a dry one, is a good substitute.

EXERCISE next claims our consideration, and we briefly notice its effects on the different systems of organs. (1) The most important effect of muscular exercise is on the *lungs,* the quantities of inspired air and of exhaled carbonic acid being very much increased. Taking the air inspired in a given time in the horizontal position as unity, a man walking 3 m. per hour inspires 3·22; and if carrying 34 lbs., 3·5; a man walking 4 m. per hour inspires 5; and when walking or running 6 m. per hour, no less than 7. Almost twice as much carbonic acid is exhaled during exercise as during rest. Hence, muscular exercise is necessary for due removal of the carbon; and it is obvious that in prolonged rest, the carbonaceous food must be diminished, or the carbon will be liable to accumulate in the system; and further, that, for strong exercise, carbonaceous food should be freely given. (2) The action of the *heart* rapidly increases in force and frequency during exercise. The increase in the number of beats may range from 20 to 30, and is sometimes much more. After exercise, the heart's action is diminished Excessive exertion may do harm by inducing pulmonary congestion, and even hæmoptysis, palpitation, hypertroyhy, valvular disease, and occasionally rupture; while deficient exercise probably tends to induce tuberculous disease of the lung, weakness of the heart's action, and probably dilatation and fatty degeneration. From these facts we learn that when a person commences any new form of exercise or gymnastics, the heart's action

should be watched, and if the pulse rise to 120 or more, the exercise should for the time cease. (3) The *skin*, by muscular exercise, becomes red from increase of blood in the capillaries, and the perspiration is increased, being at least doubled. The bodily heat is kept down by cutaneous evaporation, which reduces the temperature. During exertion, there is very little danger of chill, but the danger becomes great when the exertion is over, because there is then a rapid fall in the heat of the body, while the evaporation of the skin continues. Hence, while the skin may be freely exposed during exercise, it must be covered immediately afterward, to prevent any feeling of coolness on the surface. (4) The *muscles* grow to a certain limit, but over-exercise of any special group may produce wasting. Care must be taken that the exercise is of such nature that all the muscles, and not single groups, be brought into play; and that in early training, long intervals of rest intervene between the periods of exercise. (5) The effect of exercise on the *mind* is not clearly determined; great bodily activity is often observed in association with full mental activity; but there is some fear that, in our great schools and universities, rowing, and baseball, and football—all of admirable use—are being pressed by rivalry to a degree not helpful to either body or mind. (6) *Digestion* is improved by exercise. The appetite increases, and nitrogenous substances, fats, and salts, especially phosphates and chlorides, are required in greater quantity than in a state of rest. (7) The *change of tissues* is increased by exercise; in other words, the excretions give off increased quantities of carbon, nitrogen, water, and salts. The muscles require much rest for their reparation after exercise, and they then absorb and retain water, which seems to enter into their composition. So completely is the water retained in the muscles, that the urine is not increased for some hours. Hence, there is absolute necessity of water for the acting muscles, and the old rule, held by trainers, of allowing only the smallest possible quantity of fluid must be wrong.

The amount of exercise which should be taken by an adult healthy man is a subject of great importance. Prof. Haughton, in *New Theory of Muscular Action*, calculates that a laboring man daily exerts a muscular force to a degree which may be expressed by saying that it would raise to the height of 1 ft. from 250 to 350 tons. For persons not obliged to labor, the force expended, including that required for ordinary avocations, should average 150 tons, equivalent to walking about 9 m. daily. It is unfortunately impossible to arrange scales of exercise for invalids, women, and children. Prof. Haughton has shown that walking on a level surface is equivalent to raising the $\frac{1}{20}$ part of the weight of the body through the distance walked. When ascending a height, a man of course raises his whole weight through the height ascended. Using his formula, $\frac{W+W'D}{20\times2,240}$ (where W is the weight of the person, W′ the weight carried, D the distance walked, 20 the

coefficient of traction [see FRICTION], and 2,240 the number of lbs. in a ton), we obtain as a result the number of tons raised 1 ft.; and on applying it, we get the following table:

Kind of Exercise.	Weight done in Tons lifted one foot.
Walking 1 mile,	17·67
" 20 miles,	353·4
" 1 mile, and carrying 60 lbs.,	24·75
" 20 miles, " "	495

Thus, a march of 10 m., with a weight of 60 lbs. (about the weight that a soldier carries when in marching-order, but without blankets and rations), is a moderate day's work. A 20 m. march with this weight is a very hard day's work. As a continuous effort, Prof. Haughton believes that walking 20 m. a day without a load (Sundays excepted) is good work.—On the important subjects of horse-exercise, boating, dancing, gymnastics, etc., see the special works; on the subject of exercise, see MUSCULAR FORCE, ORIGIN OF.

The CONSTRUCTION OF HOUSES, especially of dwelling-places for the poor, and public lodging-houses, next claims our notice. There can be no doubt that the frequency and fatality of the epidemics of the middle ages were in a great measure due to unhealthful habitations. The houses were usually closely packed in crowded streets; and were often built for the purpose of defense, at a sacrifice of ventilation, lighting, draining, etc. At the present day, with all our boasted civilization, the dwellings of the poor, both in our large towns and in our country villages, are often a disgrace to humanity. In recent years much has been done by benevolence in great cities, for providing far more healthful and commodious dwelling-places for those who can afford to pay but very low rent. Many of these improved dwellings seem fever-proof, and the death-rate has been much lower than in adjacent places. But even without aid of private benevolence, and on a fair business basis, the erection of blocks of improved dwellings for working people has proved remunerative. Five conditions are requisite to healthful habitations, on whatever scale of size or expense: (1) A site dry and not malarious, and an aspect which gives light and cheerfulness; (2) ventilation sufficient to carry off all respiratory contaminations of the air; (3) a system of immediate and perfect sewage removal; (4) due supply and proper removal of water; (5) a construction of the house such that perfect dryness of its foundation, walls, and roof is insured.—On the important subject of sewage, see SEWERAGE: SEWAGE EARTH CLOSET.

Another subject closely connected with hygiene is DISPOSAL OF THE DEAD. Its importance is evident in view of the changes which the body undergoes after death. A body that has been buried gradually breaks up into a large number of comparatively simple compounds, e.g., carbonic acid, ammonia, sulphureted and carbureted hydrogen, nitrous and nitric acid, and certain more complicated gaseous matters with a very fetid odor, which finally undergo oxidation; while the non-volatile substances usually enter into the soil, and either pass into plants, or

are carried away by the water percolating the soil. These changes are accelerated by the worms and other low forms of life that usually swarm in decomposing bodies; and the character of the soil materially influences the degree of rapidity of destruction. The bones remain almost unchanged for ages. If a body is burned, decomposition is incomparably more rapid, and different volatile combinations may arise; the mineral salts and a little carbon alone remaining. The question is, What is the best method of disposing of the dead, so that the living may suffer the least? Putting aside the repulsive schemes for turning the dead to commercial account, and the plan of committal to the sea as impracticable except near the coast, there are three methods for consideration—viz., burial in the ground (see BURIAL); burning (see CREMATION); and desiccation—a method as yet only theoretic, but promising (see MAUSOLEUM, NEW).—As to Burial—long the prevalent mode—the air over cemeteries is always contaminated, and water percolating through them is unfit for drinking. The evils are in some degree lessened by making the grave as deep as possible, and by placing not more than one body in one grave. Plants should be freely introduced into every cemetery, for absorption of organic matters and of carbonic acid; and the most rapidly-growing trees and shrubs should be selected, in preference to the slowly-growing cypress and yew. The superficial space allotted to each grave varies in different countries from 30 to 90 ft.; the depth should be at least 6 ft. The grave space for a person above 12 years of age should be at least 9 ft. by 4, and for a child of less than 12 years, 6 ft. by 3. Not less than 4 ft. of earth should be placed over the coffin of an adult, and 3 ft. above that of a child. The time which should elapse before a grave is disturbed for a new tenant varies with the soil and the distance of the body from the surface Under favorable circumstances, a coffin containing an adult will disappear with its contents in about 10 years; while in a clayey or peaty soil, it will remain a century. It is generally assumed that a period of 14 years is sufficient for the decay of an adult: but long before this time, all will have disappeared but the skeleton. Mortuaries or houses for reception of the dead until the period of the burial, should be provided, at least in cases of death from infectious disease. In parts of Germany, the deposit of the dead in such houses is compulsory.

Among governmental regulations for preventing the spread of infectious and contagious diseases, Quarantine (q.v.) was one of the earliest. Quarantine against yellow fever was instituted in the colony of Mass. Bay as early 1648; a similar precaution was taken in the province of as S C. 50 years later, and in the last year of the same century in Penn. Congress made provision for quarantine first in 1796.—Public attention began to be directed in the United States to the question of sanitation of cities 1847, when the Amer. Med. Assoc. appointed a committee to study and report on the sanitary condition of the principal centres of population. The first state to take action for promoting

the public health was Mass., whose legislature appointed a committee to consider a plan for effectively checking the spread of disease, and (1850) ordered printed that committee's admirable report. The plan proposed by the committee 'for the promotion of public and personal health' included the establishment of a state board of health and the enforcement of sundry measures of prevention that to this day are reckoned among the efficient agencies of public sanitation. The great epidemic of yellow fever 1853 led to appointment by the Health Board of New Orleans of a commission to investigate the origin and transmission of that disease; to inquire into the condition of the sewerage of the city; and to suggest measures for removing the causes of liability to the infection. A 'quarantine congress,' the first of many, assembled in Philadelphia 1857, at which 26 different seaboard cities were represented. The principal object was to promote uniformity of quarantine regulations. The second congress (1858) was styled a 'quarantine and sanitary convention,' and committees were appointed to propose plans, 1, for promoting 'external hygiene,' i.e., quarantine; and, 2, the sanitation of cities. Thus the objects of the convention were multiplying, and in the 4th convention (1860) among the matters discussed quarantine no longer held the principal place: in fact the physical purification of cities was declared to be of more importance than any measures for exclusion of contagion and infection.—During the civil war sanitary science and the practice of sanitation received unexampled impetus from the pressing needs of the armies and from the wisely directed work of the U. S. Sanitary Commission (q.v.). The Sanitary Congress or Convention intermitted its meetings during the war—or rather continued its labors and held daily meetings in every city, village, and hamlet throughout the whole country; for in the south also there was an organization to render to the Confederate armies such services as were rendered to the Union armies by the U. S. Sanitary Commission.—The public interest in sanitary science awakened by the operations of the Sanitary Commission did not die out after the return of peace: in particular, the lesson taught by the effective sanitation of New Orleans during its occupation by the U. S military authorities bore fruit. It was seen that to cope with epidemics in great centres of population public authorities armed with ample powers, and guided by the best medical and sanitary counsels, were indispensable. Such public authority was instituted in the city of New York 1866, by act of the state legislature—the Metropolitan Board of Health. To that board is due the warding off, during its first year, of an invasion of Asiatic cholera.—Mass. instituted the first *State* Board of Health 1869, thus at last carrying out the advice of the legislative committee of 1850. Other states followed the example of Mass., the first being Cal., but Va. did likewise the same year, 1871.—The Amer. Public Health Assoc. was organized 1872 for 'the advancement of sanitary science, and the promotion of organizations and measures for the practical

application of public hygiene.' It has a large membership, of men mostly having theoretic and practical acquaintance with the science and art of sanitation; its meetings are held annually, and its reports and prize essays have done much to develop and popularize sanitary science.

The 'Sanitary Code' of the Health Dept. of New York city fairly represents the measure of power possessed by boards of health in large cities of the United States, and the methods and agencies employed. The Health Dept. of New York is empowered to abate nuisances and suppress manufactures, etc., detrimental to public health; to regulate the sale of poisons; to prescribe the conditions of the inhabitableness of houses or tenements; to enforce due provision of privies and proper maintenance thereof in tenement-houses, manufactories, etc.; to require that all drains, soil-pipes, etc., be adequate for their purposes; to prevent the sale of diseased or offensive, tainted, or unwholesome, or adulterated food; to regulate slaughter-houses; to regulate transit of offal or refuse matters through the streets; to require necessary but offensive manufactures (e.g., gasworks) to conduct their operations in such a way as not to be dangerous or injurious to life or health; to prohibit use of materials liable to decay for filling up or raising the level of any grounds; to prevent the sale of illuminating oils, etc., below the standard of safety; to prescribe regulations for collection and removal of garbage, refuse, etc.; to abate or minimize the smoke nuisance; to take summary measures for preventing the spread of contagious or infectious diseases of animals; to stay the spread of infectious and contagious diseases among the people (one of the means to this end consists in requiring physicians to report to the Sanitary Bureau every case of such diseases within 24 hours; also to report all deaths among their patients from such diseases; similar reports are required of keepers of lodging-houses and hotels, managers of asylums, refuges, etc., masters, chief officers of ships coming into the port, and other persons in like situations); to prescribe rules for unloading from vessels of skins, hides, rags, etc ; to require of the health officers of the port weekly reports of the number of vessels in quarantine, number of persons in the quarantine hospitals, the diseases with which they are afflicted, etc.; to prohibit the removal from place to place within the city of persons sick with small-pox or other contagious disease, except under official supervision; to provide the means of isolating such persons; to enforce vaccination; to regulate the disposal of dead bodies and the transit of dead bodies through the city; to require of coroners reports of cases coming before them; also to require from clergymen, magistrates, and other persons who may perform a marriage ceremony, detailed returns of the age, condition, residence, etc., of the parties; and from physicians, midwives, etc., returns of births; to make sanitary regulations for management of lines of public conveyance. Every person who omits or refuses to comply with the provisions of the

sanitary code is 'liable to arrest, suit, penalty, fine, and punishment' provided and declared in the acts creating the department and defining its powers. When the board demands that any nuisance be abated, and the person or persons chargeable fail to comply, the board abates it by its own officers. See HEALTH; VITAL STATISTICS; SEWERAGE; WATER SUPPLY.

SAN JACINTO, *sân ja-sĭn'tō,* BATTLE OF: near San Jacinto Bay, Texas, 1836, Apr. 21, by Texan and Mexican soldiers. Harrisburg, then the seat of the Texas government, was burned by the Mexicans in the night, Apr. 18. The Texan army, numbering only 783, was commanded by Gen. Houston; and the Mexicans, about 1,600, were led by Gen. Santa Anna. Houston retreated toward the San Jacinto ferry; and Santa Anna, to prevent his crossing, brought his force to the bay. There was some light skirmishing Apr. 20. The following day, with the cry 'Remember the Alamo!' the Texans made a violent charge upon the Mexican force, which they surprised and quickly drove from the field. Santa Anna was afterward captured, but was paroled. The Mexicans lost about 600 killed and several hundred prisoners; the Texan loss was only 8 killed and 25 wounded.—The rallying cry, 'Remember the Alamo!' referred to a cowardly massacre a few weeks previous of the six survivors of 140 Texans and helpers from the United States, who had been captured by a Mexican force of 4,000, at a fort near San Antonio.

SANJAK, *săn'jăk,* or SANGIAC, n. *săn'jĭ-ăk* [Turk. a standard]: in *Turkey,* term denoting a subdivision of an *Eyalet* (q.v.), because the ruler of such a subdivision, called *sanjak-beg,* is entitled to carry in war a standard of one horse-tail. The sanjak is frequently called a *liva,* and its ruler a *mirmiram.* SANJAKATE, same as Sanjak.

SAN JOAQUIN, *sân hwâ-kēn',* RIVER: river of California, rising in the Sierra Nevada, flowing first s.w. to its junction with the outlet of Lake Tulare, thence n.w. to its junction with the Sacramento river, 50 m. from the Bay of San Francisco. It receives numerous branches from the Coast Range of mountains and the Sierra Nevada. Entire length 350 m., for only a small portion of which it is navigable for large vessels.

SAN JOSÉ, *sân hō-sā':* city, capital of Santa Clara co., Cal.; on the Central and the Southern Pacific railroads; 6 m. s.e. of San Francisco Bay, 28 m. e. of the Pacific Ocean, 47 m. s. of San Francisco; 5 sq.m. It is connected by railroad with San Francisco, the ocean, and the s. part of state, and is a well-built modern city. The four public parks, the excellent roads extending out into the valley, the equable climate, all contribute toward making San José a desirable residential center. It is situated in a fertile agricultural region, the beautiful Santa Clara Valley, famed for the variety and amount of its fruit.

There are large canneries, packing-houses, and shipping establishments connected with the fruit industry, also flour mills, grain elevators, lumber mills, woolen factories, basket and box factories, a foundry, machine shops, yards for marble-cutting and granite polishing, tanneries, and several other industrial establishments. The annual output of the farm and fruit products is valued at $6,500,000.

The principal public buildings are the government building, which cost $200,000; the city-hall, in the Plaza; the court-house and Hall of Records, opposite Saint James Park; the Y. M. C. A. building, the churches, schools, and charitable institutions. The educational institutions are the State Normal School, in Washington Square, a park of 28 acres; the University of the Pacific (M. E.); Notre Dame College (R. C.), for young women; Academy of Notre Dame (M. E.); Notre Dame College (R. C.), for boys; Notre Dame Institute (R. C.), a training and technical school for orphans; a public high school, six public kindergartens, public and parish elementary schools, two commercial colleges, four private schools, and a public library. Near S. on the e. is Mount Hamilton, crowned with the buildings of the great Lick Observatory (q.v.), and on the w. is the Stanford Univ., organized 1891, erected by Leland Stanford at a cost of more than $20,000,000, as a memorial to his deceased son.

Pop. (1890) 18,060; (1900) 21,500; (1910) 28,946.

SAN JOSE': city, cap. of Costa Rica, Central America, midway between the Pacific and Atlantic oceans. It stands on a table-land 4,500 ft. above sea-level, contains a number of important institutions, and has active trade. Its port is Punta Arenas, Pacific coast. Pop. (1901) 23,903.

SAN JUAN Island: island in San Juan co., Washington, in Washington Sound, s. of the Gulf of Georgia, near lat. 48° 30′ n. and long. 128° w.; 15 m. in length; about 60 sq. m. It has coal and limestone, and in the s. the soil is fertile, but the n. part is mountainous and covered with valuable timber. There is excellent fishing along the coast. Several smaller islands belong to the same county.—S. J. is noted for the dispute between Gt. Britain and the United States regarding the boundary established 1846, which involved the ownership of the island, and was known as the San Juan Boundary Question. In 1848 Gt. Britain made the claim that the line passed s. of S. J. through Rosario Straits; the United States contended that it passed along lat. 49° n. from Lake of the Woods and turned southward through the Canal de Haro, and Straits of Fuca in order only to give Gt. Britain the whole of Vancouver's Island, part of which would have been given to the United States if a straight line had been maintained. The British occupied the island 1859, and the United States govt. promptly sent a force to secure its rights. A friendly agreement was reached and the British occupied the n. and the Americans the s. part of the island. The proposal to submit the matter to arbitration was several times rejected

by the United States; but 1871, during the session of the Alabama claims commission at Washington, it was agreed to submit the question to the king of Prussia, who sustained the claim of the United States. The British force was withdrawn 1872, Nov.

SAN JUAN, *sân hwân*, RIVER: river in Nicaragua, through which the waters of Lake Nicaragua flow into the Caribbean Sea, at Greytown. It is about 120 m. long, flows s.e., is difficult of navigation on account of rapids, has several branches; and a wide delta with three channels, of which one, the San Juan, could be used as part of the Nicaragua canal to connect the Atlantic and Pacific.

SAN JUAN DE POR'TO RI'CO: capital of the island of Porto Rico and of the province of Bayamon, and important seaport. It is picturesquely situated on an island in a bay on the n. coast. The harbor is safe and commodious. The city is well drained, and has an excellent water supply. It has a cathedral, bishop's palace, military hospital, arsenal, theatre, a seminary and many schools. Was founded by Ponce de Leon in 1511. In 1898, July, United States forces occupied the city. Pop. (1910) 48,716.

SANK: pt. of SINK, which see.

S'ANKARA, *sân'ka-ra*, Hind., *sŭn'kûh-rûh*, or SANKARÂCHÂRYA, i.e., the *âchârya*, or spiritual teacher, S'ankara: one of the most renowned theologians of India: assigned by tradition to a date about B.C. 200; but with more probability, to the 8th or 9th c. after Christ. He was born probably in Kerala or Malabar, and of the caste of the Nambûri Brahmans; and he founded the sects of the *Das'nâmi-Dand'ins* (see SAIVAS). His commentaries have exercised great influence on the religious history of India; indeed he was regarded as an incarnation of the god S'iva, and was fabled to have worked several astounding miracles. See H. H. Wilson, *A Sketch of the Religious Sects of the Hindus;* works, I. (edited by Dr. R. Rost, 1862), pp. 197, ff.

SANKEY, *săngk'ĭ*, IRA DAVID: evangelist: b. Edinburgh, Penn., 1840, Aug. 28; d. Brooklyn, N. Y., 1908, Aug. 13. In early life he became interested in Sunday-school and other religious work, and his fine voice and ability as a singer soon attracted attention. He met Dwight L. Moody (q.v.) at an international convention of the Young Men's Christian Association, engaged with him in evangelistic work in Chicago, in Great Britain 1873-75 and 1883-4, and at various times in the principal cities of the United States. He not only sang but made frequent addresses, and labors in inquiry meetings. He composed many popular melodies, and compiled a volume of *Sacred Songs and Solos*, of which there have been several translations, and which had immense sale; *Winnowed Songs* (1890); *Young People's Songs of Praise* (1902); etc. In 1903 Mr. Sankey became blind.

SANKHYA, *sâng'khyâ* [Skr. *sankhyâ,* synthetic reasoning]: name of one of the three great systems of orthodox Hindu philosophy (see SANSKRIT LITERATURE). It consists of two divisions—the Sânkhya, properly so called, and the YOGA (q.v.); and like the other systems (see MÎMÂNSÂ and NYÂYA), it professes to teach the means of attaining eternal beatitude, or complete and eternal exemption from every sort of ill—viz., the discriminative acquaintance with *tattwa,* or the 25 true principles of all existence. (1) *Prakr'iti* or *Pradhâna,* substance or nature: it is the universal and material cause; eternal, indiscrete, inferable from its effects; productive, but unproduced. Its first production is (2) *Mahat* (lit. the great), or *Buddhi* (lit. intellect), or the intellectual principle, which appertains to individual beings. From it devolves (3) *Ahankâra* (lit. the assertion of 'I'), the function of which consists in referring the objects of the world to one's self. It produces (4-8) five *tanmâtrâ,* or subtle elements, which themselves are productive of the five gross elements, viz.: space, air, fire, water, earth (20—24). Ahankâra further produces (9—13) five organs of sensation, and (14—18) five organs of action; and lastly (19) *manas,* the organ of volition and imagination. The 25th principle is *Purusha,* or soul: it is neither produced nor productive; it is multitudinous, individual, sensitive, eternal, unalterable, and immaterial. The union of soul and nature takes place for the contemplation of nature, and for abstraction from it, 'as the halt and the blind join for conveyance and for guidance, the one bearing and directed, the other borne and directing.' From their union, creation is effected. The soul's wish is fruition or liberation. In order to become fit for fruition, the soul is in the first place invested with a *linga-s'arîra,* or *sûkshma-s'arîra,* a subtle body, composed of *buddhi* (2), *ahankâra* (3), the five *tanmâtrâs* (4—8), and the eleven instruments of sensation, action, and volition (9—19). This subtle body is affected by sentiments, but being too subtle to be capable of enjoyment, it becomes invested with a grosser body, composed of the five gross elements (20—24), or, according to some, of four, excluding *âkâs'a* (space), or, according to others, of one alone—viz., earth. The grosser body, propagated by generation, perishes; the subtle frame, however, transmigrates through successive bodies, 'as a mimic shifts his disguises to represent various characters.' Some assume, besides, that between these two there is intermediately a corporeal frame, composed of the five elements, but tenuous or refined, the so-called *anusht'hâna-s'arîra.*

The Sânkhya proper does not teach the existence of a supreme Being, by whom Nature and Soul were created, and by whom the world is ruled. It was therefore accused by its opponents of denying a Creator; and it is the special object of the *Yoga* system to remove this reproach by asserting his existence, and defining his

essence (see YOGA). The truth is, that the Sânkhya proper merely maintains that there is no proof for the existence of a supreme Being; it is a system of agnosticism. It underwent a mythological development in the Purân'as (q.v.), in the most important of which it is followed as the basis of their cosmogony. The most important development of the Sânkhya is that by the Buddhistic doctrine, which is mainly based on it. The Sânkhya is probably the oldest of Hindu systems of philosophy; for its chief principles are, with more or less detail, contained in the chief Upanishads (q.v.: see also VEDA); but whether the form in which it has come down to us, and in which it is now spoken of as *the* Sânkhya, is also older than that in which the other systems are preserved, is not known.

The reputed founder of the actual Sânkhya is *Kapila* (lit. *tawny*), who is asserted to have been a son of Brahmâ; or, as others prefer, an incarnation of Vishn'u. He taught his system in Sûtras (q.v.). The best summary of the Sânkhya doctrine is by I's'wara Kr'ishn'a, in *Sânkhya-Kârikâ*, ed. by H. H. Wilson, with transl. of the text by H. T. Colebrooke (Oxford 1837). Among essays on the Sânkhya philosophy, the best is by H. T. Colebrooke, reprinted from the *Transactions* of the Royal Asiatic Society, in his *Miscellaneous Essays* (London 1837), vol. I., p. 227, ff.

SANKT POL'TEN. See ST. PÖLTEN.

SANKWORK, n. *săngk'wĕrk* [probably a corruption of *scamp-work* (see SCAMP)]: the slang and familiar name for soldiers' clothes, made for the contractors at a low rate of pay.

SAN LUCAR DE BARRAMEDA, *sân lô'kâr dā bâr-râ-mā'thâ:* seaport of Andalusia, in the northern province of Cadiz, 18 m. n. of the port of Cadiz; on a sandy, undulating tract on the left bank of Guadalquivir at its mouth. It is a dull, decaying place, notable chiefly as the mart whence inferior and adulterated vintages are exported as sherries. Pop. 23,000.

SAN LUIS DE LA PUNTA, *sân lô-ēs' dā lâ pôn'tâ:* chief town of the province of San Luis in the Argentine Republic, 445 m. w.n.w. from Buenos Ayres, on a river which falls into the large salt lake of Bevodero. San Luis de la Punta has trade in horses, hides and furs. Pop. 16,000.

SAN LUIS POTOSI, *sân lô-ēs' pō-tō-sē':* state in e. Mexico; of irregular form; bounded n. by Coahuila, e. and n.e. by Nuevo Leon, Tamaulipas, and Vera Cruz, s. by Hidalgo, Querétaro, and Guanajuato, and w. by Zacatecas; 27,500 sq.m. Except in the s.e., where there are low plains, the surface is elevated and there are ranges of mountains. There are large deposits of precious metals, valuable forests, and good pastures. There are various manufactures and the mines are worked to

some extent. Large numbers of cattle and sheep are kept, and corn, wheat, and other grain are cultivated. Cap. San Luis Potosi. Pop. (1900) 582,486.

SAN LUIS POTOSI, *sân lô-ēs' pō-tō-sē':* city in Mexico, capital of the state of same name, near the source of the river Tampico, 200 m. w. of the port of Tampico on the Mexican Gulf, with which it was connected by railway 1885. It stands on a plateau 6,350 ft. above sea-level, is well built, containing many handsome edifices, chiefly ecclesiastical, and is surrounded by gardens. Its markets are well supplied, and it has considerable trade with the neighboring states. Shoes, hats, and hardware are the chief manufactures, and woven fabrics and liquors are imported from Tampico. Pop. (1889) 62,573; (1900) 61,019.

SAN MARCO IN LAMIS, *sân mâr'kō ĭn lâ'mēs:* town of s. Italy, province of Foggia, 18 m. n.n.e. of Foggia. It has trade in corn, wine, oil, and silk. Pop. more than 15,000.

SAN MARCOS: Texas; town, county-seat of Hays co.; on the San Marcos river, and on the International & G. N., and the Missouri, K. & T. railroads; 30 m. s.w. of Austin. It became the county-seat on the organization of the county in 1848. It is in an agricultural region, cotton and corn being the chief products; stock-raising is also carried on in the vicinity. The town contains steam cotton-gins, and cotton-seed-oil mills, also a United States fish culture station. There are two national banks with a combined capital of $130,000. A group of boiling springs is located within the town limits. It has a public high school, established in 1891; and contains the grounds of the Texas Chautauqua Association. It is also the seat of the Coronal Institute, a secondary school established by the Methodist Episcopal Church South in 1879, and of the Lone Star Business School. Pop. (1910) 4,071.

SAN MARINO, *sân mâ-rē'nō,* or MARI'NO: one of the most ancient and most limited republican states in the world, consisting of a craggy mountain 2,200 ft. high, amid the lesser ranges of the Apennines, and encircled by provinces formerly belonging to the Pontifical States. It comprises the town of San Marino, and several villages in the adjacent territory; 33 sq.m. The climate is healthful, but, owing to its exposure, high winds and frequent rains prevail. The town of San Marino is built on a slope of the mountain; it is accessible by only one road, and is protected by walls and towers; it contains several squares and streets, rudely paved, and various public buildings, including five churches, a town-hall, a theatre, the governor's palace, convents, museums, and hospitals. The inhabitants are noted for hospitality, sobriety, industry, and general morality. They are sensitively jealous of their rights, and cling with tenacity to their territorial and legislative independence. Their chief trade is in agricultural produce and cattle.

SAN MARTIN, José de: general: 1778, Feb. 25—1850, Aug. 17; b. Yapeyú, Argentine Republic. He was educated in Spain for military life and had reached the rank of lieutenant colonel when the revolt against the royalists caused his return to South America, 1811. He organized the Argentine insurgents, won many victories; led an expedition which secured the independence of Chili, but declined the presidency of that country, though he organized its government; invaded Peru, seized Lima 1821, drove the Spaniards from the coast and took the title 'Protector of Peru'; but the following year, after a consultation with Gen. Bolivar, resigned and secretly went to Europe, where he remained in obscurity till his death 28 years later, at Boulogne, France.

SAN MIGUEL, *san mē-ghĕl':* town of Central America, in San Salvador, about 80 m. e. of the city of San Salvador. It is said to be the chief trading town in Central America. At its annual fair of La Paz, 15,000 strangers assemble, and business to the amount of $2,000,000 is transacted. About 5 m. w. of San Miguel is a volcano, 6,680 ft. high, occasionally in eruption. Ordinary pop. 12,000.

SAN MIGUEL DE MAYUMO: Philippines; pueblo, province of Bulacán, Luzón; on the San Miguel river; 26 m. n. of Bulacán. It is on the main highway at the junction of several others; and the river is navigable for native craft. It is the commercial center of a fertile agricultural region; excellent timber is obtained on the surrounding mountains and iron is mined at Sibul, 8 m. distant. The climate is especially healthful, and there are medicinal springs in the vicinity of the iron mines. The town suffered considerable damage during the insurrection on account of its proximity to insurgents' hiding places in the mountains. Pop. 20,460.

SANNAZRO, *sân-nâ-dzâ'ro,* Jacopo: Italian poet: 1458, July 28—1530, Apr. 27; b. Naples; of Spanish descent. Love for a young lady, Carmosina Bonifacia, whom he celebrated under the names of Harmosine and Filli, called into exercise his poetical faculty. The lady being insensible to his passion, he went on foreign travel, and during his absence composed the *Arcadia,* a medley of prose and verse, which Tiraboschi, historian of Italian literature, praises highly; and which went through 60 editions, and gave its author the reputation of an Italian classic, though to modern readers it seems insipid. Sannazro, after his return to Italy, was invited to the Neapolitan court.

SAN NICANDRO GARGANICO, *sân nē-kân'dro gâr-gâ-nē'ko:* town of s. Italy, province of Foggia, 26 m. n. of the city of Foggia; on Mt. Gargano, being one of the most populous towns among those mountains. The lands belonging to it are very fertile, and great herds of cattle and sheep are reared there. It trades in grain, wool, and wine. Pop. 9,000.

SAN NICOLAS, *sân nē'ko-lâs,* or SAN NICOLAO, *sân nē-ko-lâ'o:* one of the Cape Verde Islands (q.v.).

SANPO. See DIHONG; BRAHMAPUTRA.

SAN PEDRO: Cal.; city in Los Angeles co.; on San Pedro Bay, an inlet of the Pacific Ocean, and on the San Pedro, L. A. & S. L., and the Southern P. railroads; about 25 m. s. of Los Angeles. The harbor, enlarged and otherwise improved by the government, is one of the good harbors of the Pacific coast. The breakwater, 8,000 feet long, cost over $3,000,000. The harbor when the improvements are completed (1903) will have a clear depth of 30 feet, permitting the largest vessels to enter the inner harbor. San Pedro is in an agricultural region and near sections in which there is considerable mining. Its chief industries are connected with exporting grain, fruit, and minerals.

SAN PEDRO, Paraguay: a town situated on a branch of the Paraguay river, about 100 m. n. of Asunción. It is accessible for small steamers, and exports maté. Pop. about 6,000.

SAN PIO QUINTO, *pē'ō kēn'tō:* a port on the western coast of Camiguin Island, n. of Luzon, extending 2 m. inland, and 3 m. wide. It is sheltered by Font Island lying in the middle of the entrance with a channel on each side. Near the entrance to the s. is a boiling spring of salt water; a stream of fresh water enters this harbor. It is one of the principal cruising stations of the United States navy in the waters of the northern Philippines.

SAN RAFAEL: Cal.; town, county-seat of Marin co.; on San Pablo Strait, and on the North Pacific Coast and the San Francisco & North Pacific railroads; 15 m. n. of San Francisco. It is the center of a stock-raising, dairying, and agricultural region; and has frequent communication with San Francisco both by railroad and ferry. It is situated near Mount Tamalpais and is a well known health resort. It contains Saint Vincent's Male Orphan Asylum. It has a public high school, with a library of about 1,800 volumes (1904); and is the seat of San Rafael Institute, the Dominican College (for girls), a Roman Catholic secondary institution, the Hitchcock Military Academy, and the Mount Tamalpais Military Academy. Pop. (1900) 3,879; (1910) 5,934.

SAN REMO, *sân rā'mō:* city of n. Italy, province of Porto Maurizio, 27 m. e.n.e. of Nice, on the slope of a rising ground on the shores of the Mediterranean. Its fine cathedral, the Santurio della Guardia, and the Santuario dell' Assunta are worthy of notice, the last having four handsome pillars of alabaster. The palace of the Marquis Borrea D'Olmo contains a fine picture-gallery. There is a seminary for priests, besides a college and many schools. Through the little harbor there is brisk trade in oils and lemons. Nine foreign consuls reside in

the town. San Remo is an ancient city, obscure in its origin. In 1170 it was self-governed, and made an alliance with the Genoese against the Pisans. One of its bishops afterward sold it to Genoa.—The location is protected from n. winds by lofty hills, and has a fine climate. 'San Remo is perhaps the mildest situation on all the Riviera. Here palms, lemon, and orange-trees grow with the greatest luxuriance, and the fruit of the date palm almost attains maturity.'—Murray's *Handbook*. In recent years it has been largely resorted to by English visitors, and several new and excellent hotels have been erected, contrasting with the picturesque houses of the ancient towns. Pop. about 16,055.

SANS, prep. *sânz* [F. *sans*, without—from L. *sĭnĕ*]: in *OE.*, without. SANS-CULOTTES, *sanz-kū-lŏt'* [F. without breeches]: fellows without breeches; contemptuous name applied to the Revolutionists of France in the time of Louis XVI. (see below). SANS-CULOTTERIE, *sanz'kū-lŏt'rē*, the French Revolutionists as a body; their opinion. SANS-CULOTTIST, n. *sanz' kŭ-lŏt'ĭst*, extreme republican; extreme revolutionist. SANS-CULOT'TISM, n. *-tĭzm*, extreme republican principles. See SANS-CULOTTES.

SAN SALVADOR': island of the Bahama group; first American land seen by Columbus; long supposed to be the same with Cat Island; now believed to be Watling's Island (q.v.). See BAHAMAS.

SAN SALVADOR': town in Brazil. See BAHIA.

SAN SALVADOR': city, capital of the republic of Salvador; founded 1589, supplanting a town built 1528 by a brother of Pedro de Alvarado. It was the capital of the Union of Central America 1823-39. In 1854 it was a fine city, with numerous good buildings, and pop. more than 30,000; but on the night of 1854, Apr. 16, it was destroyed by earthquake, and about 100 lives were lost. 1855, Jan., it again became the seat of government. Violent shocks of earthquake 1879-80 did damage here and wrought remarkable changes around Lake Hopango. The trade of San Salvador is carried on mostly through the port of La Libertad, about 5 m. distant. Pop. (1901) 59,540.

SAN SALVADOR', or BANZA, *bân'zâ*—the former the Portuguese, the latter the native name: town of Africa, capital of Congo; 120 m. s.e. by e. from the mouth of the estuary of the river Congo, in a mountainous district near the source of the river Lelunda. Pop. 20,000.

SAN SALVADOR. See SALVADOR.

SANSCÂ'RA, or SANSKÂ'RA (lit. completing, perfecting): name of the ten essential rites or ceremonies of the Hindus of the first three castes, being the ceremonies to be performed at stated times from the conception of a child till the completion of his studies and his marriage.

SANS-CULOTTES, *sănz-kū-lŏts'* [Fr., 'without breeches']: name given in scorn, at the beginning of the French Revolution, by the court party to the democratic 'proletaires' of Paris. The latter accepted this superfine reproach with sardonic pride, and the term soon became the distinctive appelation of 'good patriots,' especially as these often made a point of showing contempt for the rich by neglecting their apparel, and cultivating rough and cynical manners. —This is the current interpretation in England and America (as in Carlyle's works); but it should be observed that Littré, best authority on French etymology makes no mention of breechlessness in the sense of raggedness in his definition of the word; but, on the contrary, says that the S. 'were so called because they gave up the knee-breeches in fashion during the *ancien régime*, and took to wearing trousers or pantaloons.' The other notion of raggedness must have been tacked on later by a wilful pun. Toward the close of the Convention, the name, connected as it had been with all the sanguinary excesses of the period, fell into bad odor, and disappeared.

SAN SEBASTIAN, *sân sā-bâs-tē-ân'*: rising seaport city in n. Spain, cap. of the Basque province of Guipuscoa, 381 m. n.n.e. of Madrid (402 m. by the North of Spain railway). It is on a peninsula, at the s. base of a conical hill, Mont Orgullo, 400 ft. high, commanding a most striking view, and crowned with a castle strong enough to have obtained for itself the name of the Gibraltar of n. Spain. Since its almost total destruction during the Peninsular War, the town has been rebuilt on a rectangular plan. The streets are narrow, bordered by high houses with curtained balconies in front. E. of the town is a confined gulf, formed by the embouchure of the Urumea; and on the w. is a roadstead, protected against enemy and tempest by the Isle of Santa Clara, and a series of rocks, which offer to vessels only a narrow and dangerous pass. The roadstead is bordered by a beautiful shore, which, as a watering place, attracts visitors from all parts of the country. The town communicates with the mainland by a narrow tongue of land, and by a bridge across the Urumea, connecting S. S. on the peninsula with the railway station on the mainland. By the North of Spain railway, opened 1864, the town is in direct communication with Madrid and Paris. Commerce is increasing. Nearly 200 vessels, of about 50,000 tons, yearly enter and clear the port; annual value of imports, about $2,092,000; exports, about $355,000. The exports are principally of wool, flour, wine, cutlery, firearms, copper-ore, and lead; imports, salted fish, sugar, silk and cotton and linen goods, cocoa, machinery, etc. Pop. (1887) 29,047; (1900) 37,812.

S. S. has suffered numerous sieges. The most memorable was in 1813, when S. S. was defended against Wellington by a French garrison of 3,000 men. When the defenders surrendered, 5,000 of the English troops had been killed or wounded: and the victors in spite of their officers, but according to the usage of war, committed disgraceful excesses.

SAN SEBASTIAN: saint; who lived in the 3d c.; celebrated martyr of the early church, whose memory is venerated in both branches of the church, east as well as west (though the scene of his martyrdom was the city of Rome), and whose story has formed one of the most popular themes of Christian artists from earliest times. His history is contained in the so-called acts of his martyrdom, which, though partaking of the legendary tone, are regarded as authentic, not only by Baronius and the Bollandists, but also by Tillemont and others of the more critical schools of eccles. history. S., according to this narrative, was born at Narbonne and educated at Milan. Although a Christian, he entered the Roman army, without revealing his religion, and with the view of being enabled, by his position, to assist and protect the Christians in the persecution. In this way he supported and comforted many of the martyrs in Rome; and he even converted Nicostratus, keeper of the prison in which the martyrs were confined, and his wife, Zoe, to whom, according to the story, he miraculously restored the use of her speech, after she had been dumb six years. Still unrecognized as a Christian, S. rose to high favor under Diocletian, while the grateful pontiff, Caius, named him 'Defender of the Church.' At length came the time for his open profession of his faith. Diocletian used every effort to induce him to renounce the Christian creed, but in vain; and in the end he was condemned to be put to death by a troop of Mauritanian archers, who transfixed him with numberless arrows, and left him as dead. But a Christian lady, Irene, finding that life was not extinct, had the body removed to her house, where life was restored; and though the Christian community desired to conceal his recovery, S. again appeared in public before the emperor, to profess his faith in Christianity. Diocletian condemned him to be beaten to death with clubs in the amphitheatre; and his body was flung into one of the sewers of the city, in which it was discovered, according to the Acts of Martyrdom, by means of an apparition, and carried by a Christian lady, Lucina, to the catacomb which is still called by his name. The date of his martyrdom was 288, Jan. 20. By the Greeks the feast is held Dec. 20. The festival was celebrated with great solemnity in Milan as early as the time of St. Ambrose; and it was observed in the African Church in the 4th c.—Another saint of the same name is said to have suffered martyrdom in Armenia.

SAN SEVERINO, *sân sā-vā-rē'no:* city of central Italy, province of Macerata, 15 m. w.s.w. of the city of Macerata. It is well built, and has handsome palaces, the finest of which are the Palazzo Comunale, and that of the bishop. The neighborhood produces exquisite wine, oil, and fruit, and cattle are reared on the pasture grounds. Pop. 4,000.

SAN SEVERO, *sân sā-vā'ro:* city of s. Italy, province of Foggia; in a delightful and fertile open country, producing abundant grain, tobacco, and wine, and affording rich pasturage. It was formerly the chief town of the Capitanata. In 1799, it was taken, and nearly destroyed by the French. The cholera committed fearful ravages here 1865.—Pop. about 19,756.

SANSEVIE'RA ZEYLANI'CA: see BOWSTRING HEMP.

SANSKRIT, or SANSCRIT, *săn'skrĭt* [from Skr. *sam* = Gr. *syn*, 'with, together,' and *kr'ita*, 'done' (cognate with Lat. *cres*), with an epenthetic *s*, imparting emphasis to the sense of the compound; hence, 'thoroughly done, finished, accomplished']: ancient and still the literary language of India, and radically connected with the various dialects of Hindustan—also allied to the principal European languages; the language in which the whole sacred literature of the Hindus and by far the greatest amount of their numerous ritual, legal, poetical, and scientific works is written. SANSKRITIST, n. one learned in the anc. Skr. language.—*Sanskrit* belongs to that stock of languages commonly called Indo-European, or Indo-Germanic, or Aryan, which includes the Indian, Medo-Persian, Græco-Latin, Germanic, Lithuanian-Slavonian, and Gallo-Celtic families. It is therefore intimately allied to the ancient and modern languages comprised in each of these families, itself being the parent of the *Prâkr'it* (q.v.) dialects, the *Pâli* (q.v.), and the languages spoken in n. India. Compared with the ancient languages kindred with it, S. has come down to us in a preservation and development so much superior to theirs, that it must be regarded as the principal means for our understanding of the affinity, and in general the linguistic laws which pervade the structure of these languages. The essay of Franz Bopp *Ueber das Conjugations System der Sanskrit Sprache* 1816, May 16, began a new era in the study of language. See PHILOLOGY: BOPP.

There are two great periods into which the history of the S. language may be conveniently divided: the first embracing the language as contained in the Vedic hymns (see VEDA); the second, that represented by the so-called classical S., in which the epic works, the law codes, and the later literature are written. Between the two there is a transition period of the language, to which the Brâhman'a and ritual portion of the Vedas, and the Upanishads, may be assigned. In the language of the Vedic hymns, the grammar is less developed and much less settled than in the classical S.; it contains, moreover, many forms which at the second period became obsolete, or disappeared from use; the structure of its sentences, too, is simpler, though it is more elliptical than in classical poetry. Another main difference between the two periods is in the sense of its words. Though this is the same in many words of the Vedic hymns and the classical literature, still there are numerous words, which, though the same in form at both periods, have a sense which differs according as it belongs to the one or the other class of writings. The difficulty

thus presented by the Vedic hymns is in great measure removed by the commentators who explain the meanings of the Vedic words, and, in doing so, follow tradition, which, considering the peculiarities of Hindu history, and also internal evidence, is probably immemorial, therefore the safest if not the only guide in the understanding of the oldest Vedic works. That their explanations may have become unsafe in some instances, would be but natural; but it is certain that these instances are rare exceptions; and it is certain likewise that when modern Sanskritists—and several of these only imperfectly acquainted with S. grammar—have attempted to supersede those traditional meanings by interpretations which they suppose better suited to the context, or to some assumed etymology of their own, their rendering may better adapt the Vedic to the classical vocabulary, but is sure to falsify that understanding which the Hindu mind had of its oldest and most sacred works, and on which its further historical development is based. In the transition period of the Brâhman'a and ritual portion of the Vedas and the Upanishads, grammar and vocabulary offer similar difficulties to those of the Vedic hymns; but though for this reason the aid of the commentaries is likewise indispensable, they are much less numerous; and in those works of this extended period, composed probably at the classical epoch, the difference between the two is even inconsiderable. In comparing S. with kindred languages, it is therefore necessary not to lose sight of these periods of the language, and of their peculiarities.

SAN'SKRIT LITERATURE: ancient literature of India (see SANSKRIT, above). The most natural, and, at the same time, most scientific distribution of S. L. would be that according to the dates at which its writings were composed. The actual condition of Sanskrit philology, however, renders such a course impossible; for, except very few works, no date whatever is known to which they could be safely assigned. (See INDIA—*Religion:* VEDA.) In spite, therefore, of an apparent plausibility with which some authors have propounded a regular literary chronology of Sanskrit works, even with figures or dates appended, the general reader will do well to consider all such dates imaginary. Under these circumstances, the only possible arrangement of S. L. is that suggested by the contents irrespectively of date of composition; but, under each head, in that order which, within large margins, may suggest consecutiveness.

1. *Religious Literature.*—It comprises, in the first place, the Vedas, and the mystical, philosophical, and ritual works connected with them (see VEDA: UPANISHAD); secondly, the PURAN'AS (q.v.) and TANTRAS (q.v.), besides prayer-books and smaller works, and treatises of less importance relating to the modern worship, based on the two latter classes of works.

2. *Law Literature.*—It is comprised under the name of *Dharmas'âstra* (from *dharma*, law—religious and civil—and *s'âstra*, book), and its origin is traceable to the ritual

Sûtras relating to the Vedas. A complete Dharmas'âstra consists of three portions: the first treating of *Achâra*, or 'established rules of conduct'; the second treating of *Vyavahâra*, or judicature, including law, private and criminal; the third, on *Prâyas'chitta*, or penance. The chief extant representatives of this class are the codes of MANU (q.v.) and YÂJNAVALKYA (q.v.). Less complete than the latter is the code of PARÂS'ARA (q.v.); but it deserves special mention, as the modern Hindus consider it to have been especially composed for the requirements of the Kaliyuga, or the present mundane age. For practical purposes, the chief actual authorities are the commentaries on Manu, and the digests which have grown up from them. Among the former, the MITÂKSHARÂ (q.v.) occupies the principal rank.

3. *Poetical Literature.*—(*a.*) The two great epic poems see RÂMÂYAN'A: MAHÂBHÂRATA.

(*b.*) *The Modern Epic Poems.*—Their subject-matter is entirely borrowed from the two great epic poems and other legendary works; and their only merit consists in the art bestowed by their authors on the versification and whatever relates to the æsthetical canon of Hindu poets; which has no accord with our poetical standards. Minute descriptiveness, elaborateness of diction, and an abundance of figures of speech, are some of the characteristics of these poems. The following are the *Mahâ-kâvya* or great poems of this class: the *Raghuvans'a* and *Kumârasambhava*, by Kâlidâsa (q.v.); the *Nalodaya;* the *Bhat't'ikâvya* or the poem by Bhat't'i; the *S'is'upâlabadha*, by Mâgha; the *Naishadîyacharita*, by S'rîharsha; the *Kirâtârjunîya*, by Bhâravi; and the *Râghava-Pân'd'avîya*, by Kavirâja.

(*c.*) *Lyric and Erotic Poetry.*—Several works of this class are more of a descriptive character. The principal are: the *R'itusanhâra*, a description of the seasons, attributed to Kâlidâsa (q.v.); the *Meghadûta*, or the cloud-messenger, also supposed to have been written by Kâlidâsa; the *Amarûs'ataka*, or hundred stanzas of Amaru, on amatory feelings and scenes, whose natural sense commentators have twisted into one of mystical character, so as to make them appear less objectionable, especially as they were attributed to S'ankara (q.v.); the *Bhâminîvilâsa*, by Jagannâtha Pan'd'itarâja, in four books; the *Gîtagovinda*, by Jayadeva, who lived probably in the 12th c., which, in ten sections, describes the amours of Kr'ishn'a with the cow herdesses, etc.—this poem combining the lyric and the melodramatic character.

(*d.*) *Didactic Poetry.*—A portion of this class of poetry may be included under the former head; another is contained in the episodes of the *Mahâbhârata;* another forms a portion of the books of fables. The chief special representatives of this class are, 'the three *Satakas*, or hundred stanzas on love, good and wise conduct, and renunciation of wordly desires, by *Bhartr'ihari*. For the poem *Bhagavadgîtâ*, see YOGA.

(*e.*) *Dramas.*—The plays of the Hindus are not numerous; they were acted only on special occasions, and the

subject of the plot is with predilection borrowed from the legendary literature of ancient India. Hindu dramatists have little regard for unity of time, place, and action; and except Kâlidâsa, they must be considered of little poetical worth. Besides the reasons to be sought for in the religious, mystical, and metaphysical tendencies of the Hindu mind, a free development of the Hindu drama was impeded probably also by the heavy and artificial canon which weighed upon Hindu dramaturgy, and which, ascribed to sacred sources, gave small scope for poetical imagination. The various kinds of dramatic performances, the number of their acts, the characters of the plays, the conduct of the plot, the sentiments to be represented, even the modes of diction—all were strictly regulated. This elaborate dramatical canon divided all dramatic composition into two great classes—*Rûpaka*, or performance, and *Uparûpaka*, or the minor *Rûpaka*. Neither class contains the species 'tragedy'—which is incompatible with the Hindu belief in fate. Every drama opens with a prelude in the form of a dialogue between the stage-manager and one of his company, in which the name of the author and of his work, and such prior events as the spectators should know, are brought before the audience. The entrance of a new personage is always announced by a special person. The principal characters of the play are the hero (*nâyaka*) and the heroine (*nâyikâ*). The hero has his antagonist in the *pratinâyaka*, or counter-hero; and each of these may have his officers, ministers, and friends. The heroine, on her part, has always a confidential companion, often her foster-sister. Two characters deserve special notice, as peculiar to the Hindu stage—the *Vit'a* and the *Vidûshaka*. The *Vit'a* may be the companion of a man or woman: he is generally on familar, yet dependent terms with his associate, and though somewhat like the parasite of the Greek comedy, yet not rendered contemptible; if a woman, she is a courtesan. The *Vidûshaka* is the humble companion of a prince or man of rank; he is always lively, sometimes witty, and, according to the definition of his attributes, he is to excite mirth by being ridiculous in person, age, and attire. He is, remarkably, always a Brâhman. Only the hero and the principal personages speak Sanskrit, but women—with rare exceptions—and the inferior personages speak Prâkr'it; the various, higher or inferior, idioms of that language being adapted to their higher or inferior character: see PRÂKR'IT. The oldest known Sanskrit drama is the *Mr'ichchhakat'i*, or 'the Clay Cart,' by King S'ûdraka, which, in the opinion of H. H. Wilson, was written B.C. 1st c. For the translation of several of the principal dramas, and an account of others, see H. H. Wilson's *Select Specimens of the Theatre of the Hindus* (2 vols. London 1835).

(*f.*) *Fables and Narratives*.—Fables, as such, occur, and are referred to, as early as in the great epic poems; but the oldest *collection* of fables is the *Panchatantra* (q.v.), and after it, the *Hitopades'a* (q.v.). A different class are the ghost-stories, composed for amusement. Among narra

ives of the romance class, the most celebrated are, the *Das'akumâracharitra*, or the 'Adventures of the Ten Princes,' by Dan'd'in, who lived about the middle of the 11th c., ed., with elaborate preface, by H. H. Wilson; *Kadambarî*, by Vânabhatta; and the *Vâsavadattâ*, by Subandhu (ed. by Hall, Calcutta 1859).

(*g.*) *Chronicles.*—Historical works, in the European sense of the word, do not exist in Sanskrit literature. The same causes which have clouded all Hindu chronology, and even, at recent periods of Hindu history, have transformed historical facts into myths, seem to have rendered the Hindu mind indifferent to the research and the recording of *historical* truth. The only approach to historical works is found in some chronicles, of which the most renowned is the *Râjatarangi'ni* (q.v.).

4. *Scientific Literature.*—(*a.*) *Philosophy:* see SÂNKHYA: YOGA: NYÂYA: VAIS'ESHIKA: MÎMÂNSÂ: VEDÂNTA.

(*b.*) *Grammar.*— That a scientific study of grammar was cultivated at a very early period is testified by the oldest glossator on the Vedas, YÂSKA (q.v.). The oldest extant work is the grammar of Pân'ini (q.v.), criticised by Kâtyâyana (q.v.). Of authors of grammars, not following the technical system of Pân'ini, the principal are, Hemachandra, a Jaina (q.v.) writer, and Vopadeva, who lived probably about six centuries ago, and is especially esteemed in Bengal.

(*c.*) *Lexicography.*—It consists of glossaries of words and *dhâtus*—a term which may be vaguely rendered by 'roots,' or 'radicals,' though it does not imply, to the Hindu grammarian, the idea of a linguistic *element*—and of commentaries on these glossaries. The oldest known glossary of *Vedic* words—nouns and verbs—is the *Nirukta* (q.v.) of Yâska. Among renowned glossaries of *classical* words is the *Amarakosha*, by Amarasinha, probably not later than the 3d c. after Christ. (For other works of this class, see Wilson's *Sanskrit English Dictionary*, preface to 1st ed. 1819).

(*d.*) *Prosody.*—Sanskrit prosody admits three sorts of metre: one governed by the number of syllables, and which is mostly uniform, or monoschematic, in profane poetry, but not so in various passages of the Vedas; the other regulated by feet equivalent to two long syllables or to four short; and the third regulated by the proportion of syllabic instants, without noticing the number of feet. The principal work on Vedic as well as profane prosody is the *Chhandah's'âstra* by Pingala.

(*e.*) *Art of Poetry.*—It is treated in works on dramaturgy, and works on the poetical art in general. The oldest work on the dramatic art is the *Sûtra* of Bharata; a later one is the *Das'arûpa* by Dhananjaya.

(*f.*) *Works on Music.*—In general, they treat of notes, musical scales, melodies, the art of singing, and musical instruments; and some of them also of the art of dancing and performing. It is probable that the passages in dramas and other poetical works intended for singing were written to suit fixed melodies and not that the

melodies were composed after the poet had performed his task.

(*g.*) *Amatory Art.*—Works treating of this art purport to explain and to classify all that relates to love; the chief is the *Kâma-Sûtra* of Vâtsyâyana.

(*h.*) *Astronomy and Arithmetic.*—The calendars connected with the Vedas are the earliest evidence of Hindu proficiency in astronomy; they presuppose a knowledge of a solar year of 365 days, and their date is assumed by Colebrooke to belong to B.C. 13th c.; while others place them a few centuries later. The scientific works of later Hindu astronomers are professedly based on five ancient systems, or Siddhântas, called the Paulis'a-, Romaka-, Vâs'isht'ha-, Saura-, and Paitâmaha-Siddhânta; and the earliest renowned author among these astronomers is Aryabhat't'a, who, according to Colebrooke's calculation, lived not later than the 5th c. after Christ. From the quotations by Brahmagupta, it appears that Aryabhatta 'affirmed a diurnal revolution of the earth on its axis, that he possessed the true theory of the causes of lunar and solar eclipses, and that he noticed the motion of the solstitial and equinoctial points, but restricted it to a regular oscillation, of which he assigned the limit and the period.' See, for further detail, Colebrooke's *Algebra*, etc. (Lond. 1817, p. 38). Several other ancient writers produced astronomical works of much celebrity. That Hindu astronomy is largely indebted for its progress to the kindred sciences of western nations, may be inferred from the occurrence in Sanskrit of terms of Arabic and Greek origin. Thus, the terms *horâ, dreshkân'a, liptâ, kendra*, etc., are easily traced to the Greek *hōra, dekanos, lepta, kentron*, etc.

(*i.*) *Medicine.*—The origin of Hindu medicine is referred to the god Brahman, from whom the Ayurveda, or 'the science of long life,' was obtained by Daksha, who communicated it in his turn to the As'wins. Some time after this, mankind, in consequence of their wickedness, becoming afflicted with numerous diseases, the Munis, or saints, met in the Himalaya Mountains to search for a remedy. A long list of these saints is given by *Charaka*, one of the greatest medical writers, interesting as containing several names known in Hindu history, which thus may be probably connected with the early study of Hindu medicine. The two greatest medical authorities whose works are extant are *Charaka* and *Sus'ruta* (q.v.).—See works on Hindu medicine by Wise (1860–67); articles by Haas in the *Ztschr. d. Deustch. Morgeul. Ges.* 1876–7.

(*j.*) *Architecture.*—Treatises on architecture, sculpture, etc., are collectively called *S'ilpas'âstra*. There appear to have been 32, or, according to some, 64 standard treatises on these arts; but only a few are probably extant. The most important is the *Mânasâra*, in 58 chapters, each treating of a particular topic.—See Râm Râz, *Essay* (1834).

For a more copious supply of titles of books on the subjects mentioned, see Gildemeister, *Bibliotheca Sanscrita* (Bonn 1847), Weber's *History of Indian Literature*, ed. by

Mann and Zachariah (1878), and the printed catalogues of the Library of the Indian Office, of the Sanskrit MSS. of the Bodleian Library at Oxford, and of the Sanskrit MSS. of the Royal Library at Berlin.

SANTA ANA: Cal.; city, county-seat of Orange co., on the Southern Pacific and the Southern California railroads; 30 m. s.e. of Los Angeles. It was founded in 1869. It is the commercial center of Santa Ana valley, one of the most fertile sections of California; oranges and fruits of all kinds, vegetables, wheat and sugar beets are produced in this region, and there are also large peat-beds in the vicinity. The principal industries include a fruit and vegetable cannery, flour mills, large lumber and planing mills, and soda-works. Santa Ana is connected by a local railway with Newport Beach, 10 m. distant, a popular seaside resort. There is a public high school, established in 1889, and a public library; the Orange County Business College is also located here. The city owns its waterworks, the supply being derived from artesian wells. Pop. (1900) 4,933; (1910) 8,429.

SANTA ANA: Philippines; formerly a pueblo of the province of Rizal, constituted a district of the city of Manila in 1902. It is the center of extensive vegetable gardening for Manila markets. Pop. 2,200.

SAN'TA AN'NA, Don Antonio Lopez de: long prominent in Mexican politics, and at one time president of the republic: 1798, Feb. 21—1876; b. Jalapa. While a youth he entered the Spanish army, and became lieutenant colonel 1821. When Mexico determined to throw off the Spanish yoke, Santa Anna greatly distinguished himself at the head of the Mexican troops. The Spanish royalists were expelled from Vera Cruz, and he was elected governor of the city and province. Iturbide had established an imperial rule over Mexico, but his tyranny having worked his downfall, Santa Anna proclaimed, 1822, a Mexican republic, which was recognized by every foreign state except Spain. He was incessantly engaged in quelling the civil wars kindled by the aristocratic and democratic factions. In 1829 he engaged and put to flight a division of Spanish troops which invaded Mexico by way of Tampico, with the view of again bringing Mexico under Spanish rule. The separation of Texas from the Mexican union was vigorously but unavailingly opposed by Santa Anna. In 1837 differences arose with France, and a division of French troops landed at Vera Cruz. They were gallantly engaged by Santa Anna, who drove a portion of them into the sea at the point of the bayonet. In this action he received a bullet in the leg, which rendered amputation necessary. In 1847, war having been declared by Mexico against the United States, Santa Anna took command of the Mexican forces, and offered ineffectual resistance to the troops of Generals Scott and Taylor, who stormed and took the City of Mexico and ended the war. Santa Anna then retired from Mexico,

till his recall 1853. During 30 years he had disputed the direction of affairs with Bustamente, Herrera, Cevallos, and other chiefs of parties; being at one time dictator, and at another disgraced and an exile. In 1853 Mexico, torn by civil dissensions and falling into anarchy, recalled Santa Anna. He declared himself president for life; civil war was the immediate result; and 1855 he was driven from the country. During the government of Juarez, 1858-63, Santa Anna was looked to as their chief and future ruler by an influential party. On the establishment of a hereditary monarchy under Maximilian of Austria as emperor, Santa Anna returned to Mexico, having first signed an act of adhesion to the empire; but soon began to intrigue for his own return to power, issuing addresses to the people as emperor; and was ordered to leave the country. After a residence in the United States, Santa Anna planned an expedition against Juarez, but ere a landing at Vera Cruz had been effected Santa Anna, with his secretary, was taken prisoner, and was condemned to death, but pardoned by Juarez, on condition of his leaving Mexico. He afterward resided on Staten Island, N. Y., where he spent his time cock-fighting and playing at three card monté. On the death of Juarez, 1875, he returned to Mexico, and died there.

SANTA ANNA, *sân'tâ ân'nâ,* or SANTA ANA, *â'nâ:* town of Central America, state of San Salvador, 32 m. n.w. by w. from the town of San Salvador. Pop. (1901) 48,120.

SANTA BARBARA, *sân'tâ bâr'ba-ra:* city, capital of Santa Barbara co., Cal.; on the Pacific Ocean and on the Southern Pacific railroad; 362 m. s.e. of San Francisco. It is in a rich agricultural, stock-raising, wool, and fruit-growing region; and, by reason of its delightful climate (average temperature 13 years, 55°-71°, average rainfall 16 years, 16-17 in.) and the extension of the railroad to it, 1887, has become a popular winter and health resort. It has valuable hot springs; water, gas, and electric light plants; Santa Barbara and Franciscan colleges, St. Vincent's Institute, library. Potter Hotel (cost $1,000,000), the famous 'Los Baños del Mar,' and the Anna S. C. Blake sanatorium. Santa Barbara was settled 1782; had its first mission (Roman Catholic) erected 1786; suffered from an earthquake, which destroyed the mission 1812; present mission rebuilt 1815. The city was captured by Frémont 1846. Pop. (1880) 3,460; (1890) 5,849; (1900) 6,587; (1910) 11,659.

SANTA BARBARA: Honduras; the capital of the department of Santa Barbara, situated on the Santa Barbara river, 65 m. s.w. of Puerto Cortés. It is a comparatively well built town, manufactures sombreros and spirits, and is a commercial depot for the products of the surrounding country destined for Puerto Cortés. The latter is reached by a high-road and, for a part of the way, by rail. Pop. between 5,000 and 8,000.

SANTA BARBARA: Philippines; pueblo, province of Iloílo, island of Panay, between a branch of the Janipaan river on the n. and the Tigón river on the s., 12 m. n. of Iloílo, the provincial capital. Pop. 13,000.

There is also a smaller pueblo of the same name, province of Pangasinán, Luzon, 12 m. e. of Lingayén; at the crossing of two roads. Pop. 7,595.

SANTA BARBARA DE OCAMPO: Mexico; a town in the state of Tamaulipas, situated 45 m. s. of Ciudad Victoria. It lies in a fertile river-plain at the foot of the eastern Sierra Madre, and is the center of a rice, sugar and fruit-growing district. Pop. (1895) 9,079.

SANTA CATALINA: an island of California, one of the Santa Barbara Islands; separated from the mainland by San Pedro Channel and Gulf of Santa Catalina. The island was discovered in 1542 by Juan Rodriguez Cabrillo, a Portuguese explorer in the service of Spain, and was named by him San Salvador. The explorer Sebastian Vizcaino visited the island 60 years later and gave it the present name, in honor of Saint Catharine of Sienna. The island is 25 m. long, with an average width of 4 m.; area about 55,000 acres. It is hilly and well-wooded and has many deep gorges. Avalon (q.v.) is the only town on the island. The surrounding waters abound with fish. The island is a favorite resort, especially from June to October.

SANTA CATHARINA, *sân'tâ kâ'tâ-rē'nâ:* province in s.e. Brazil, s. of São Paulo and bordered by the Atlantic Ocean; 27,436 sq.m.; known as the 'paradise of Brazil.' There are numerous mountains, but the soil is very productive, the climate is mild, and the scenery is noted for its beauty. Sugar, coffee, and rice are largely produced, and there are considerable deposits of bituminous coal. Several German colonies have been formed and are quite prosperous. The island of Santa Catharina, about 30 m. long and 8 m. wide, is well fortified and forms a bay in which large ships find safe harbor. There are also several smaller islands along the coast. Pop. about 236,346.

SANTA CLARA, *klä'rä:* town in Santa Clara co,. Cal.; on the Southern Pacific railroad, 40 m. s.e. of San Francisco. It was settled by the Franciscans in 1777, became a town in 1852, and received a new charter in 1867. It is the center of a rich agricultural and fruit-raising region, and has a number of fruit-packing establishments; it also contains several mills and a tannery. It is connected with San José, the county-seat, by a narrow-gauge railroad and electric street railway. The public school system includes a high school, and there is a public library. The town is also the seat of Santa Clara College, a Roman Catholic institution founded in 1851, and the Notre Dame Academy, a Roman Catholic convent school, and the University of the Pacific is nearby. The government is by a board of five trustees, three of whom are elected every two years. Pop. 4,000.

SANTA CLARA: city of Cuba; capital of the province of Santa Clara; on the Cuba railroad; 155 m. e.s.e. of Havana. It was founded in 1689. Formerly it was the eastern terminus of the railroad from Havana, but in 1902 the railroad system was extended to the eastern end of the island. It is the center of a fertile agricultural region, is the second largest inland city of Cuba, and has considerable commercial importance, which is increasing with the development of the railroad facilities. Silver has been mined in the vicinity, but not successfully; an excellent quality of asphalt is obtained and exported; and illuminating gas for lighting the city has been manufactured from this asphalt; petroleum is also reported in the vicinity. The city is well built, the streets are wide, and municipal sanitation has been improved since 1898. The location is naturally healthful and favorable for further commercial development. Pop. 14,000.

SANTA CLARA: province in the central part of Cuba, bounded on the e. by Puerto Principe and on the w. by Mantanzas; area 9,560 sq.m. The surface is undulating, with ranges of hills in the e. and s., the highest peak rising 2,900 feet. It has rich agricultural lands; the production of sugar is the chief industry. Tobacco, coffee, and fruits are other products of commercial importance; wax and honey are obtained; and the timber is abundant and valuable, there being 307,910 acres of public forests in the province. There are also excellent grazing grounds, and cattle raising is a profitable industry. The mineral resources are second only to those of the province of Santiago de Cuba, but not so well developed; asphalt, copper, gold and silver are found. The Cuba railroad traverses the province from e. to w., and there are short branch roads; there are few good highways, however, and the need of improvement in transportation facilities is felt. Pop. (1899) 356,357.

SAN'TA CLAUS. See NICHOLAS, SAINT.

SANTA CRUZ, *sân'tâ krôss:* city, capital of Santa Cruz co., Cal.; on Monterey Bay, and on the Southern Pacific railroad; 80 m. s.e. of San Francisco. It is an agricultural, stock-raising, dairying, and fruit and vine-growing region; manufactures flour, lumber, leather, paper, powder, lime, and foundry products; and has valuable deposits of bituminous rocks. It is a favorite seaside resort noted for its cliff scenery and other attractions, and has a college, seminary, churches, graded public and parochial schools, orphan asylum, city hall, public hall and free library. Pop. (1900) 5,659; (1910) 11,146.

SAN'TA CRUZ, or STE. CROIX: island of the Virgin group. See VIRGIN ISLANDS.

SANTA CRUZ: Mexico; a town in the state of Guanajuato, situated in a fertile agricultural district a few miles s.e. of Guanajuato. Pop. (1895) 7,444.

SANTA CRUZ: Philippines; pueblo, capital of the

province of Laguna, Luzon; on s.e. shore of the Bay Lagoon (Laguna de Bay), at the mouth of the Santa Cruz river; 34 m. s.e. of Manila. It is connected by highway with Manila, Batangas, Cavite, and Tayabas, and carries on an important trade. It is also the terminus of a projected railroad from Manila. The region is famous for the manufacture of palm wine or brandy, the sale of which was a government monopoly under Spanish rule. The town is well built and contains fine municipal and ecclesiastical buildings. Pop. 13,140.

There are also three smaller pueblos of the same name: (1) Pueblo, province of Dávao, Mindanao, on Dávao Bay, 15 m. s. of Dávao; it has an excellent harbor of good depth; pop. 720; (2) pueblo, province of Ilocos Sur, Luzon, 34 m. s. of Vigan; on the main highway; pop. 5,876; (3) pueblo, province of Zambales, Luzon, on seacoast; 32 m. n. of Iba; on the main highway; pop. 4,600.

SANTA CRUZ ISLANDS, or QUEEN CHARLOTTE ISLANDS: Melanesia; an archipelago in the Pacific Ocean, belonging to Great Britain, and situated in lat. 10° s. and long. 166° e., n. of the New Hebrides, and e. of the Solomon Islands. The group comprises several large and a number of small islands, with a combined area of 362 sq.m. The larger islands are volcanic and mountainous. Most of them are surrounded by coral reefs, and nearly all the small islands are of coral formation. The climate is hot, humid and unhealthful, but the soil is very fertile, and the vegetation luxuriant. The inhabitants, who are chiefly Melanesians and still uncivilized, are supported partly by their plantations of coco-palms, partly by fisheries and by trading with neighboring islands. The archipelago was discovered in 1595 by Mendaña. Since 1898 it has been an administrative dependency of the Solomon Islands. The pop. is about 7,000.

SANTA CRUZ DE NAPO: Philippines; pueblo, province of Marinduque, on the n.e. coast, 18 m. e. of Boac. The town lies about a mile and a half from the shore, and 3 m. from the anchorage ground. It is a port of entry for coasting vessels, and the anchorage is well protected; there is difficulty, however, in landing at the point nearest the town. Santa Cruz is surrounded by a fertile agricultural country; it is not as well built as Boac, the provincial capital, but its situation is more advantageous owing to the superior harbor. Pop. 15,800.

SANTA CRUZ DE LA PALMA, *dā lâ pâl'mâ:* town, capital of Palma, one of the Canary Islands; on the e. coast of Palma, on a specious bay 7 to 10 fathoms deep. There is manufacture of silks and hosiery. Pop. about 5,000.

SANTA CRUZ DE SANTIAGO, *sân'tâ krôss dā sân-tē-â'go* (in Teneriffe, *tĕn'ē-rĭf*): city, capital of the Canary Islands, and chief seaport of the group; on the n.e. side of the island of Teneriffe. Its port, the safest in Canaria, has been greatly extended and improved by two

moles, with a united length about 5,400 ft., which inclose a large space affording excellent anchorage in two to nine fathoms. The streets are broad, the houses whitewashed and flat-roofed, and several of the public buildings striking in appearance. The town is defended by several forts and redoubts. Formerly large quantities of wine of excellent quality were grown in Teneriffe, and shipped for export at Santa Cruz de Santiago; now the principal export from this and the other islands is cochineal. Coal from England, with manufactured goods, hardware, and furniture are imported. Of imports, more than a third come from England, and the annual imports amount to about $800,000. Pop. 13,228.

SANTA CRUZ DE LA SIERRA: Bolivia; (1) town, capital of the department of Santa Cruz de la Sierra; on the Piray river, on the eastern slopes of the Andes. The town was founded in 1575, and originally bore the name of San Lorenze de la Fontera. The houses are mostly one story high, built with timber and earth, with large balconies and uneven roofs. (2) Department, the easternmost department of Bolivia, bounded on the n. by the rivers Beni, Mamore, Itenez, and the Brazilian province Matto-Grosso; on the e. by the river Paraguay and the Brazilian territory; on the s. by the Pilcomayo and the desert of Gran Chaco; on the w. by the departments Cochabamba and Chuquisaca; area 126,340 sq.m. It is mostly level, except in the western part, where it reaches the Andes. It is drained by the Rio Mamore and the Rio Beni, and their tributaries. The central region is mostly heavily wooded, with some open marshes and plains. It is thinly populated, the most of the towns being in the western part and along the rivers. The soil between the mountains and the central forests is fertile and yields sugar, coffee, cacao, and rice. Some cotton cloth is manufactured and gold is mined in the mountain district. Pop. (estimated) 209,850.

SANTA CRUZ DE TENERIFFE: Canary Islands; city, capital and commercial port of the Canary Islands, on the n.e. coast of the island of Teneriffe. Many of the houses are handsome, and of one and two stories high; but the majority are low. The streets are well paved, and lighted by electricity. There is a square, surrounded by wooden edifices, and adorned with a colossal statuary group representing the apparition of the Virgin of Candelaria to the Guanches, the original inhabitants. Besides the custom-house and the military hospital, there are scarcely any public buildings; the church of San Francisco is the finest. The harbor, which is very secure, has a magnificent mole, of modern construction; other works, including a breakwater, have recently been constructed. Tomatoes, bananas, potatoes, wine, brandy, and cochineal are the chief articles exported; and the imports consist largely of English, French, Spanish, and German manufactures, with coal, grain, flour, etc. Pop. 16,000.

THE SO-CALLED OLDEST HOUSE IN THE U. S., SANTA FE, N.M.

SANTA CRUZ, ANDRES: Bolivian soldier and politician: b. La Paz, Bolivia, about 1794; d. Saint Nazaire, France, 1865. He was of partial Indian descent, entered the Spanish army and rose to the rank of colonel. He was captured by the patriots in 1820, persuaded to adopt their cause, became a general in the army, and led an invasion of Upper Peru in 1823. In 1826-7 he was acting president of Peru under Bolivar and in 1829 he was elected president of Bolivia for a term of 10 years, receiving also the title of grand marshal. His measures were progressive and the country enjoyed great prosperity under his administration. From the first he adhered to his purpose of uniting the Pacific coast republics, and his successful invasion of Peru in 1836 was followed by his proclamation of the Peruvian-Bolivian confederation. In 1839 a Chilean army invaded Bolivia and defeated Santa Cruz at Yungay. He resigned and left the country, whereupon the confederation was dissolved. He was afterward engaged in Europe on various diplomatic missions for Bolivia.

SANTA FÉ, *sân'tâ fā:* city, capital of Santa Fé co., and of the territory of N. M.; on Santa Fé creek and on the Atchison, Topeka & Santa Fé, and the Santa Fé Southern railroads; 20 m. e. of the Rio Grande del Norte, 430 m. s. of Denver; altitude 7,300 feet. It is claimed by many to be the oldest city in the United States. When the Spaniard Cabeza de Baca penetrated the valley of the Rio Grande to the site of the present city, 1538, he found it occupied by an Indian pueblo or village of 15,000 people. The dwellings were constructed after the manner of the earliest Aztec civilization, and many of them still remain. The Spaniards conquered the Indians, and after driving the last one from the pueblo, established a government of their own about 1550. The first Spanish governor built a palace on the s. side of the Plaza Juan de Otermine, which has ever since been used by Spanish, Mexican, and American governors. The Spaniards also, soon after the conquest, erected the church of San Miguel (rebuilt 1710), and about 1600 that of Our Lady of Guadeloupe. In 1680 the Indians recaptured the place, drove all Spaniards out, destroyed churches, buildings, relics, and archives, and closed up the gold mines that the Spaniards had opened. In 1694 the Spaniards again conquered the Indians, and began rebuilding churches and public buildings. The city was governed by Spanish and Mexican officers till 1846, Aug. 18, when it was occupied by U. S. troops under Gen. Stephen W. Kearny. It is in a mining, agricultural, and stock-raising region; is supplied with water from the mountains by means of four reservoirs near the famous Aztec springs, and has gas and electric light plants. Gold, silver, copper, lead, zinc, and bituminous and anthracite coal are mined in the vicinity. The most notable buildings are the old palace, now used by the territorial government; the churches of

San Miguel and Guadeloupe; remains of Fort Marcy (built 1846); Roman Catholic cathedral (cost $400,000); territorial capitol ($200,000); territorial penitentiary ($150,000); Ramona School for Indian Girls ($65,000); University of New Mexico (Congregational), opened 1881; Santa Fé Academy (Presbyterian); Presbyterian Academy (1881); St. Michael's College (Roman Catholic); and St. Catherine's Boarding and Industrial School for Indian Boys (Roman Catholic). The Roman Catholic Church maintains also several parochial schools, St. Vincent's Sanitarium for people in quest of health, St. Vincent's Hospital for men and women, and St. Vincent's Orphan Asylum for girls only. With its fine climate and historical associations Santa Fé attracts health seekers and tourists, but as a business center has declined steadily since the building of the first railroad diverted the overland trade to Albuquerque. Pop. (1910) 5,072.

SAN'TA FÉ DE BOGOTA'. See BOGOTA.

SANTALACEÆ, *săn-ta-lā'sē-ē:* natural order of exogenous plants, mostly trees and shrubs. The leaves are undivided, sometimes minute. The perianth is superior, 4-5 cleft. The stamens are 4 or 5, opposite the segments of the perianth, and inserted into their bases. The ovary is 1-celled, with 1-4 ovules. The fruit is 1-seeded, nut-like, or drupaceous.—There are about 110 known species, natives of various parts of the world, the European species being obscure weeds, while the trees of the order occur chiefly in the East Indies, New Holland, and the South Sea Islands. In North America, besides some shrubs on the s. Alleghanies, chiefly the Oil Nut, or Buffalo Nut (*Pyrularia oleifera*), there is a low herb, common at the north, *Comandra umbellata,* 6-10 in. high, the 5 stamens connected with the white calyx-lobes by tufts of hairs; hence the name [*komē,* hair, *andros,* of man]. SANDAL-WOOD (q.v.) is the product of plants of this order. The leaves of *Osyris Nepalensis* are used for tea. Some species are used in medicine in their native countries. *Fusanus acuminatus* is the Quandang Nut of New Holland: its taste and qualities resemble those of Sweet Almonds, as do also those of the seed of the *cervantesia tomentosa* of Peru. *Pyrularia oleifera,* the Buffalo Tree or Oil Nut, has a large seed, from which, in the southern states, oil is obtained.

SANTALIN, *săn'ta-lĭn,* or SANTALIC ACID, *săn-tăl'ĭk:* the coloring matter of *Pterocarpus santalinus,* or red sandal-wood (see SANDAL-WOOD) is readily obtained by digesting the rasped wood in alcohol, and then precipitating the santalin by free addition of water. It is used in India in dyeing silk and cotton. It is because of the santalin in it that red sandal-wood is retained in the *Pharmacopœia* as a coloring agent for tinctures, etc.

SANTALUM, n. *săn'ta-lŭm:* sandal-wood; typical genus of *Santalaceæ.*

SANTA MARIA, *sân'tâ mâ-rē'â:* city, in province of Cadiz, Spain; on the bay of Cadiz, where it receives the Guadalete river 6 m. from the city of Cadiz. There are manufactures of brandy, liqueurs, soap, hats, leather, and wax, and an immense export trade in wine. It contains many handsome buildings, and is famous for the annual bull-fights in May. Pop. about 22,000.

SANTA MARIA, Philippines: (1) Pueblo, province of Ilocos Sur, Luzon, 15 m. s. of Vigan. It is on the main highway, and several cart roads lead from here to the interior. In Dec., 1900, 2,150 insurrectionists surrendered here, and took the oath of allegiance to the United States. Pop. 10,030. (2) Pueblo, province of Zamboanga, Mindanao, also called BIASONGAN, on the western sea-coast at the mouth of a river; 56 m. n. of Zamboanga. It has a well-sheltered harbor. The surrounding region is heavily timbered with valuable woods, and a large saw-mill has been erected here. (3) Pueblo, province of Pangasinan, near the Agno river, 32 m. e. of Lingayen; pop. 3,940. (4) Pueblo, province of Zamboanga, Mindanao, in the extreme s.w., 3 m. n.w. of Zamboanga, the provincial capital; pop. 2,200.

SANTA MARIA DI CAPUA-VETERE, *mâ-rē'â dē kâ'pô-â vā-tā'rā:* city of s. Italy, province of Caserta. It is not handsome but new, and its population is increasing. The neighboring soil is very fertile, and produces abundant grain, fruits, oil, and excellent wines. Its manufactures consist of cloth and other woven materials and hats. Pop. about 18,500.

SANTA MARIA DE PANDI, Philippines: Pueblo, province of Bulacán, Luzon; on the Santa Maria river, 3 m. from its mouth; 6 m. n.e. of Bulacán. It was almost entirely destroyed during the insurrection, as it was the military centre of the insurrectionists, and was burned by American troops. It is in a productive rice and fruit region. Pop. 10,510.

SANTA MAURA, *mow'râ,* or LEUCA'DIA (anc. also *Leucas,* so called from its white cliffs): one of the Ionian Islands, off the w. coast of the ancient Greek province of Acarnania, from which it is now separated by a passage about a mile wide, though according to tradition it was in early times connected with the mainland by an isthmus. The canal across the isthmus, which converted the peninsula into an island, is said to have been cut by the Corinthians. Santa Maura is about 22 m. long, and 6 to 9 m. broad; 180 sq.m. Its surface is very uneven. It is traversed by a range of hills from n. to s., which end at the s. extremity in the high white cliffs, 2,000 feet high, called by the Italian sailors of the Levant Cape Ducato (corruption of *Leucates*), but better known under the name 'Sappho's Leap.' Pop. 20,147.

SANTANDER, *sân-tân-dār'*: important and thriving seaport of Spain, in the modern province of S.; on a magnificent bay, inlet of the Bay of Biscay, about equally distant from Oviedo, on the w., and San Sebastian on the e. The bay is two to three m. wide, and about four m. long, and is accessible to the largest vessels at all tides. The situation of the town, on a headland protected by a hill, is picturesque; among its older edifices few are either interesting or important. Of its former convents, one now serves as a theatre; another as a cigar-factory, giving employment to about 1,000 people. Numerous new houses, and handsome warehouses, and commercial establishments of various kinds have been erected in recent years. The half of the province of S. may be said to be impregnated with iron, copper, zinc, and other ores; though, hitherto, the timidity of native capitalists has prevented extensive mining. In one year, 12,625 tons of iron and copper ores, with a quantity of quicksilver and cobalt, were shipped from the port of S. to Great Britain alone. Wheat is an important element in the trade of S. The annual exports amount to about $7,500,000, nearly all of wheat and flour. The imports—chiefly sugar from Cuba; textile fabrics from England, France, Belgium, and Germany; and salted cod-fish from Norway—amount to about $9,000,000. A railway runs s. from S. to Venta de Banos, on the North of Spain railway; and in the middle portion of it, from Barcena to Reynosa, 21 m., there are 22 tunnels. Pop. 56,000.—The *province* of S. has 2,111 sq. m.: pop. (1877) 235,299; (1887) 242,843; (1900) 276,003.

SANTAREM, *san-ta-reng'*: interesting old town and river-port of Portugal, on the right bank of the Tagus, 46 m. n.e. of Lisbon by railway. It carries on active trade in the products of its fertile vicinity with Lisbon, with which there is steam-communication by river also. Pop. about 8,000.

SANTA ROSA, *sân'tâ rō'zâ*: city, cap. of Sonoma co., Cal.; on Santa Rosa creek, and on the San Francisco and Northern Pacific and the Central Pacific railroads; 60 m. n. of San Francisco. It is in the richest wine-growing region in the state, the co. having the largest vineyard under one management in the world. The chief industries are the manufacture of wine, flour, and leather; agriculture and stock-raising also are largely carried on. The city contains city and co. buildings, 8 churches, a national bank, Christian College, high and graded public schools, water-works, gas and electric light plants, and 2 daily and 1 weekly periodicals. Pop. (1880) 3,616; (1890) 5,220; (1900) 6,673; (1910) 7,817.

SANTEE, *săn-tē'*, RIVER: in S. C.; rising in the Blue Ridge in N. C., by two principal tributaries, the Congaree and Wateree, and flowing s.e. to the Atlantic Ocean; lat. 33° 6′. It is navigable 150 m. to Camden, and is bordered, in its lower course, by rice-swamps and pitch-pine forests.

SANTERRE, *sŏng tär'*, ANTOINE JOSEPH: French revolutionist, who for some time exercised an influence quite disproportioned to his feeble abilities: 1752, Mar. 16—1809, Feb. 6; b. Paris. He was a brewer in the Faubourg Saint-Antoine, and gained influence in his district by his wealth, and by honesty and generosity toward his workmen. He received high military commands, in which he showed utter incapacity.

SAN THIAGO, *sân tē-â'gō*, or SANTIAGO, *sân-tē-â'gō:* largest of the Cape Verd Islands (q.v.).

SANTIA'GO DE CHILI, *dā chē'lē*, commonly SANTIA'GO: city, cap. of the republic of Chili and of the province of S.; an archbishop's see; at the w. base of the Andes, 1,800 ft. above sea-level, 90 m. e.s.e. of Valparaiso. It was founded 1541 by Pedro de Valdivia, but has only recently acquired importance. Its climate is delightful; the plain is fertile in vines, figs, melons, and other fruits. The valley or plain of S. is sprinkled with tasteful villas and well-cultivated farms. The city is arranged in squares, and the houses are generally low, built around a court or garden intended as a refuge during the frequent earthquakes. But of late years it has become the fashion, in spite of earthquakes, to build costly houses of two, three, and even four stories, with facade toward the street. The Alameda, shaded with poplars, and coursed by two streams, is a pleasant promenade. The Mint, a portion of which serves as one of the president's palaces, and as offices for the ministers, is the handsomest of the many beautiful public buildings. The univ. comprises the five faculties of philosophy, mathematics and physical sciences, medicine, law, and theology. There are important educational institutions (including a normal school), noble libraries, and a museum. Besides the official journal there are several daily papers. On the w. side of the great square, which is adorned with a fine fountain, is the cathedral. 1863, Dec. 8, one of the churches, La Compania, was destroyed by fire during service, and 2,000 out of the 3,000 of the congregation—mostly women—met a dreadful death. Gold, silver, and lead are exported; imports are chiefly manufactured goods, wines, and spirits. The chief trade is with Valparaiso by the Valparaiso and Santiago railway, opened 1863. Pop. 256,413.

SANTIA'GO DE COMPOSTELLA, *dā kŏm-pŏs-tĕl'lâ:* important and famous city in n.w. Spain, former cap. of Galicia, and, from the number of pilgrims by whom it was annually visited, 'the Mecca of Spain'; 32 m. s.-by-w. from Coruña. It is extremely picturesque in appearance, from its hill-girt situation on an uneven site. The cathedral, on the site of a former edifice, was founded 1082, and its buildings cover more than three acres. Pop. 23,000.

SANTIAGO (or ST. JAGO) DE CUBA, *sân-tē-â'gō dā kō'bâ:* city and seaport, formerly cap. of the island of Cuba, and now the chief town of the e. dept. of the island; on a bay on the s. coast, at the mouth of the stream S. de C. It is hemmed in by mountains, and is reputed the most unhealthful place in the island. Its harbor is deep, well protected, and fortified. It communicates by railway and telegraph with the other towns of the island. As a seat of commerce, it takes rank after Havana and Matanzas. It is delightfully situated. The Spanish-American war (q v.) brought S. into prominence owing to the military and naval engagements which occurred in its vicinity 1898, June 14 to July 17, and ended in the surrender of the city on the later date. The articles of capitulation included the return to Spain of all prisoners of war, and the surrender of the province of Santiago and all Spanish forces therein.

It was at the mouth of S. harbor that Hobson (q.v.) sank the *Merrimac*, June 3, and that Admiral Cervera, trying to escape with the Spanish fleet, was attacked by an American squadron, under the command of Admiral Sampson, and totally destroyed on July 3. See SPANISH-AMERICAN WAR; UNITED STATES. On July 20 the American flag was raised over the city, and Gen. Leonard Wood was appointed military governor. Pop. (1887) 71,307.

SANTILLA'NA, Marquis DE: see MENDOZA, IÑIGO LOPEZ DE.

SANTLEY, *sánt'lĭ*, CHARLES: singer: b. Liverpool, England, 1834, Feb. 28. He received a musical education in England, and afterward studied in Italy; returned to England 1857, and appeared in London in *The Creation;* became an opera-singer 1859, and soon ranked as the leading baritone singer of the day. He has appeared in many of the large cities of Europe, and has visited America.

SAN'TO DOMIN'GO: see SAN DOMINGO: DOMINICAN REPUBLIC: HAYTI.

SANTON, n. *săn'tŏn*, or SAN'TOON, n. *-tōn* [Sp. *santon*, a hypocrite—from L. *sanctus*, holy]: a Turkish dervise or priest, esteemed by the people as a saint; a Mohammedan monk.

SANTONIN, or SANTONINE, n. *săn'tō-nĭn* [Gr. *santon'-ŏn*, wormwood, found in the country of the *Santonēs*, in anc Gaul], ($C_{15}H_{18}O_3$): vegetable principle possessing slightly acid properties, obtained from the seeds and flower-heads of several species of *Artemisia*. The British Pharmacopœia gives as its source *Santonica*, 'the unexpanded flower-heads of an undetermined species of artemisia,' imported from Russia: it is the *Southernwood* or *Levant Wormseed*. S. is one of the most efficacious anthelmintics or vermifuges, the most obstinate cases of ascarides and lumbrici almost always yielding to its prolonged use. Pure S. may be given in powder combined with scam-

mony or rhubarb, the dose being from half a grain to two grains, according to the age of the child. The French prescribe it in lozenges made with white sugar and mucilage; these usually act satisfactorily. Küchenmeister, one of the highest authorities on intestinal worms, prefers santonate of soda, which he obtains by digesting an alcoholic solution of Santonin with carbonate of soda, evaporating, and crystallizing. The dose is two to eight grains mixed with sugar. Two very peculiar symptoms occur after the administration of Santonin. The urine often acquires a reddish tint, which may give rise to an unfounded suspicion of the presence of blood in that fluid; and under its influence, vision becomes remarkably affected for a few hours, every object appearing either yellow or green to the patient. No satisfactory explanation of the latter phenomenon has yet been given.

SANTONINOXYME, *săn-tō-nin-oks'ĭm* [Eng. *Santonin* and *Hydroxylamin*]: substance produced by action of chlorhydrate of hydroxylamin on santonin. It is a white crystalline substance, soluble in alcohol and ether, but dissolving in water, whether acid or alkaline, only with difficulty. It is reported to have the same action in the intestines as santonin, but owing to its less solubility it is far less poisonous. As an anthelmintic, santoninoxyme may be administered in doses thrice as large as the standard dose of santonin.

SANTOOISM, n. *sān'tô-ĭzm*: the chief religion of Japan.

SANTORIN' (island). See THERA.

SANTOS, *sân'tōs*: one of the chief ports of the province of São Paulo, in Brazil, 34 m. s.s.e. of the city of São Paulo, of which it is the port. It is on the n. side of the island of Engua Guaçu, and commands a fine bay. Sugar, coffee, and other products are exported. Pop. (1900) about 20,000.

SANTOS-DUMONT, ALBERTO: French aeronaut: b. São Paulo, Brazil, 1873, July 20. He was educated chiefly in France, and has resided in Paris since the death of his father, a coffee planter. Having experimented in aeronautics he made an ascent on July 4, 1898, from the Jardin d'Acclimation, Paris, in a spherical balloon 18 feet in diameter. At this time he was engaged upon the construction of a dirigible balloon which he completed so as to make the trial ascent on Sept. 20. It proved itself dirigible, but the experiment ended in disaster owing to the insufficiency of the air-pump. A second and a third machine were constructed, the latter being cigar-shaped, 66 feet long and 11½ feet in greatest diameter. It carried a 4½ horsepower petroleum motor to work a 5-foot propeller making 2,500 revolutions a minute. It was steered by a rudder of silk and bamboo having an area of about 25 feet. This machine ascended from Vaugirard 1899, Oct. 13, sailed to the Champs de Mars, encircled the

Eiffel Tower several times, proceeded to Auteuil and finally landed at the maneuver grounds at Bagatelle. He continued experiments with new balloons, and on Aug. 18, 1901, his balloon collapsed and fell to the roof of the Trocadero Hotel. On Oct. 19, 1901, he won the Henri Deutsche prize of 100,000 francs offered for a trip from the Aero Club at Saint Cloud around the Eiffel Tower and back to the point of departure in less than an hour. The actual time employed was 29 minutes and 30 seconds, the return being made against a strong wind. In 1902 he went to Monte Carlo with the design of crossing the Mediterranean and after making several ascents suffered an accident which precipitated himself and his balloon into the bay of Monaco.

SAN VICEN'TI. See SAN SALVADOR.

SÃO FRANCISCO, *sowng frân-sēs'kō:* large river of Brazil, rising as the Paraopeba, in the province of Minas Geraes, lat. about 20° 40′ s., long. 43° 25′ w. It flows n., n.e. and e., and its lower course separates the provinces Bahia and Sergipe from Pernambuco and Alagoas. Its first considerable affluent is Rio das Velhas, which joins it from the right, lat. 17° 45′ s. Above the junction of the Velhas, at Pirapora, where the river is 1,782 feet broad, and 1,700 feet above sea-level, there is a fall of 17 feet. From the mouth of the Velhas (1,666 feet above sea-level) to the falls of Paulo Affonzo, the river is navigable 920 m., and from these falls to the mouth of the river, about 140 m., it is navigable for larger vessels and steamers. Entire length 1,652 m.; breadth at mouth is 3,486 feet.

SÃO JOÃO DEL REY: Brazil; a town in the state of Minas Geraes, situated 75 m. s.w. of Ouro Preto, on the railroad running w. from Barbacena. It was founded as a gold-mining town, but the gold has been exhausted, and the chief wealth of the town now comes from cattle raising and the manufacture of cloth. Pop. 10,000.

SÃO LEOPOLDO: Brazil; a town in the state of Rio Grande do Sul, situated on the railroad 18 m. n. of Porto Allegre. The town has two churches, a Jesuit college, and two high schools. It has had a considerable industrial and commercial development. Agriculture, viticulture and cattle-raising are carried on successfully in the surrounding country, and the town manufactures leather-goods. The products of the town have amounted to over $6,000,000 annually, most of them going to Porto Allegre, which, besides the railroad connection, can be reached by steamboats on the Rio dos Sinos. The town was founded by German immigrants, and most of the inhabitants are still Germans. It was almost totally destroyed during the civil war of 1846. Pop. (commune) 30,000.

SÃO LUÏS' DE MARANHÃO'. See MARANHÃO.

SAÔNE, *sōn:* river of France, affluent of the Rhone, rising in the department of Vosges, at Vioménil, in the

Faucelles Mountains, 1,476 feet above sea-level, and flowing s. past Gray, Châlons, and Mâcon, to its confluence with the Rhone at Lyon. Entire length 312 m., of which 170 m. are navigable.

SAÔNE, HAUTE, *ōt sōn:* department in n.e. France, bounded n. by the department of Vosges, e. by that of Haut-Rhin; 2,050 sq.m. About one-half of the entire area is in cultivable land, and more than a fourth part, comprising the n. and n.e. districts, is covered with forest-clad mountains. In the s. and s.w. are fertile plains, bounded by hills covered with vines or timber. The climate of this rich champaign district, with its bulwark of mountains against the n. and n.e. winds, is remarkably mild and healthful. Sheep, including some flocks of the merino breed, and cattle are reared in large numbers. Fruits are largely cultivated; and a few years ago 6,600,000 gallons of wine and 220,000 gallons of brandy were made annually. The arrondissements are Gray, Lure, and Vesoul, and Vesoul is the capital. Pop. of department (1901) 266,605.

SAÔNE-ET-LOIRE, *sōn-ā-lwâr':* large department in e.-central France, bounded e. by the department of Jura and the river Saône, w. by the department of Nievre and the river Loire; 3,300 sq.m. The country consists mostly of vast fertile plains, separated by rich vine-clad hills. The fertility is greatest in the vicinity of the two main streams. Horses of small but vigorous breed are reared; the excellent pasturage supports numerous herds. The wines, of which the average quantity made annually about 1883 was nearly 22,000,000 gallons, are well known as *vins de Mâcon.* Agriculture, iron-mining, and manufactures of cotton fabrics, leather, pottery, firearms, etc., are actively carried on: more than one-half the population depend on agriculture.—The department was formed 1790 out of four districts of the ancient province of Burgundy —Maconnais, Charollais, Chalonnais, and L'Autunois. It now forms five arrondissements, of which Mâcon is capital. Pop. of department (1901) 620,360.

SÃO PAULO, *sowng pow'lō:* maritime province of s. Brazil, bounded n. by the province of Minas Geraes; 112,940 sq.m. Its coast-line—part of which in the n.e. is high and rocky, though the rest is low—is about 400 m. long. Sugar, coffee, rice, millet, and tobacco are staple crops; horses, cattle, and swine are reared for export; and among minerals are the precious metals and gems. There are several commodious harbors. Cap. São Paulo. Pop. (province) 1,385,000.

SÃO PAU'LO: city of Brazil, capital of the state of São Paulo; on an uneven elevation between two small streams, tributaries of the Tiete; 220 m. w.s.w. of Rio de Janeiro. There is an Academy of Laws, attended by about 500 students. The general appearance of the town is picturesque, and the vicinity and suburbs are beautiful. The town was founded by the Jesuits before 1560, became

a city 1711, and in recent years, as the center of the state railway system, it has grown largely. Pop. 100,000.

SAO PAULO DE LOANDA, *sowng pow'lō dā lō-ân'dâ*, or LOAN'DA: city on the Bay of Loanda, capital of the Portuguese settlements in w. Africa; lat. 8° 48′ s., long. 13° 7′ e. It has a harbor formerly large and fine, but now rapidly filling up; and is defended by three poorly armed forts. A long line of white sand, known as Loanda Island, lies in front of the bay. A large part of the houses are on the low land along the shore, but the government buildings, hospital, and many of the finer structures are on elevated ground. Buildings belonging to Europeans are largely of stone, one or two stories high. Many of the streets were formerly paved, but have been neglected, and are covered with sand. The water-supply is deficient. The city was formerly a center of the slave-trade with Brazil. It now has some export-trade in ivory, palm oil, rubber, and coffee. It is the see of a bishop, but the churches and monasteries built two centuries ago are in ruins. The exactions of the home government leave no means for developing the local interests, and the city is declining. It was founded by the Portuguese 1578, but was under Dutch government 1641-48. A proportion of the whites are Portuguese convicts, or their families. Pop. about 15,000 of whom about 3,000 are white.

SÃO PE'DRO DO RI'O GRAN'DE. See RIO GRANDE DO SUL.

SAOUA'RI. See CARYOCAR.

SAP, n. *săp* [Low Ger. *sapp*, juice, wet: Ger. *saft*, juice]: the vital juice or circulating fluid of plants (see below). SAP'LESS, a. *-lĕs*, destitute of sap. SAP'LING, n. *-lĭng*, a young tree. SAP'PY, a. *-pĭ*, full of sap; juicy. SAP'PINESS, n. *-pĭ-nĕs*, state or quality of being full of sap; juiciness. SAP-GREEN, a pigment obtained by evaporating to dryness the juice of the berries of the buckthorn mixed with lime. SAP'SAGO, a green-colored cheese from Switzerland of an agreeable flavor. SAP-TUBE, the tube conveying the sap in trees. SAP-WOOD, the alburnum or external part of the wood next the bark.

SAP is the fluid which circulates in plants; indispensable to vegetable life as the blood to animal life. The root-hairs of the plant absorb from the soil the plant's nutriment, nitrogen compounds in watery solution. This crude sap, or ascending sap, permeates the stem and the branches till it reaches the leaves; in the leaves it is decomposed chemically by the action of light, oxygen being liberated, and carbon dioxide assimilated: this elaborated sap descends the branches and the stem, leaving along its route deposits which constitute the growth of the plant, of its fruit, etc. See ENDOSMOSE; CIRCULATION OF SAP; LATEX.

The greatest number and variety of experiments on the phenomena of sap, some with surprising results, were made by the late Pres. William S. Clark, of Amherst, Mass., and were detailed in annual reports of the Mass. Board of Agriculture, 1873–4 and 1874–5. A large black birch, April 30, indicated a pressure within the root equal to a column of water 85.80 ft. high; in the trunk, May 4, 84·77—or nearly twice that found by the Rev. Stephen Hales in his noted experiment on a grape-vine, 1820. Repeated trials at two different heights on the trunk gave differences of pressure equal to that of a column of water of the height of one point above the other, as if the tree were a cylinder of water; and this likeness was more strikingly exhibited by the almost instantaneous response in, e.g., the mercurial column of the lower gage when the stopcock of another gage was turned on the other side of the tree, or even the one at the top of the tree, 60 ft. above the lower. Yet Pres. Clark adduces facts favoring the supposition that sap exists for the most part as a quasi-solid in combination with cellulose, from which, e.g., in the sugar-maple, during any cold month it is partly separated by very low temperature, so that, aided by the expansion of ensuing warmth, it flows freely when the tree is tapped. He even considers much of the water absorbed by roots, as in seemingly dry ground, and much of that which is present in every tree (about 50 per cent. of the weight of green wood), as in a 'dry' state—that is, invisible. The old theory of sap was charmingly simple, namely, that it goes up in spring, down in autumn; that it travels from cell to cell by osmose, with the help of capillary attraction; and that its force and its equation are simply exhalation necessitating root-absorption; and Herbert Spencer even thought that the swaying of the tree helped circulation, as in animals. The numerous experiments of Pres. Clark disprove all this; and further go to show, not only that a vital force, above all chemical and physical forces, is manifest, but also that different species of trees have surprising peculiarities in the most of the phenomena investigated. To illustrate plant-force, one of his most novel arrangements was a test of the lifting power of growth; it was found that a large variety of squash lifted 4,120 lbs., and, so far as could be judged after an interfering accident, 5,000. As to the beginning of growth in spring, facts offer good reason to believe that sap begins to move first in buds, and the first supply of water is from the sapwood, the same source that produces growth in some kinds of cut and corded wood, and even in a slab (figured in the report) where bulging new wood bordered the edges. On the whole, the experiments (spoken of by Agassiz as a revelation) are against the former view that naturally tried to liken the circulation as well as respiration, etc., of plants, to that of animals, without resorting to investigation.

SAP, v. *săp* [S. *saper*, to undermine: It. *zappare*, to dig; *zappa*, a spade: mid. L. *sapa*, a hoe]: to subvert by digging or wearing away; to mine or undermine; to proceed by

mining ; to proceed secretly ; to undermine, as one's reputation : N. a trench or ditch employed in military operation (see below). SAP'PING, n. the art of approaching a fortress, when within range of fire, by excavating trenches in such a manner as to protect the men from fire. SAP'PING, imp. SAPPED, pp. *săpt*. SAPPERS, n. plu. *săp'pêrz*, or SAPPERS AND MINERS, in *mil.*, those specially trained men in an army who are employed in making saps, in executing field-works, and building fortifications ; in the Brit. army the term is applied to private soldiers in the corps of royal engineers, many of whom are excellent surveyors and draughtsmen. FLYING-SAP, a sap made under cover of night, or during a slackness of fire, by placing gabions simultaneously in a line, each man placing two gabions in front of him and rapidly filling them with earth. FULL SAP, a trench commenced in the usual way under the cover of a large gabion. SAP-FAGOT, a fascine placed lengthways, with a picket driven through it. SAP-ROLLERS, two gabions placed one inside the other, used as cover for the men making the sap, and pushed before them by a pole.

SAP, in Military Engineering, is a narrow ditch or trench, by which approach is made from the foremost parallel toward the glacis or covert-way of a besieged fortress. The sap is usually made by four sappers, the leading man of whom rolls a large gabion before him, and excavates as he progresses, filling smaller gabions with the earth dug out, and erecting them on one or both sides to form a parapet. The other sappers widen and deepen the sap, throwing more earth on to the parapet. A sap is considered to advance in average ground about eight ft. per hour. From the nearness of the enemy's works, running a sap is an extremely dangerous operation. When possible, therefore, it is carried on at night ; in any case, the sappers are relieved at least every hour. When a sap is enlarged to the dimensions of a trench, it bears that name.

SAPAJOU, n. *săp'ă jô*, or SAPAJO [F.—from Brazilian, *sajuassu*] : name sometimes applied to all that division of S. Amer. monkeys which have a prehensile tail, and sometimes limited to those of them which are of slender form ; e.g., the genera *Ateles* (q.v.), *Cebus* (q.v.) : see also CAPUCHIN MONKEY : SPIDER MONKEY.

SAPAN WOOD, or SAPPAN WOOD, n. *să-păn' wûd* [Sp. *sapan ;* Malay, *sapang*], or BUKKUM WOOD, *bŭk'-ŭm :* wood of *Cæsalpinia Sappan* (see CÆSALPINIA), E. Indian tree about 40 ft. high, with twice pinnate leaves, and racemes of yellow flowers. The wood resembles Brazil-wood, and is much used as dye-wood, yielding a good red color, which, however, is not easily fixed. It is a considerable article of export from Singapore and other ports of that region.

SAPHENA, n. *să-fē'nă* [Gr. *saphēnēs*, clear, manifest]: in *anat.*, a name applied to two conspicuous veins of the lower extremities—the *internal* running along the inner side of the foot, leg, and thigh, and the *external* on the outer border of the foot. SAPHE'NOUS, a. *-nŭs*, applied to the superficial vessels and nerves of the thigh and leg.

Capuchin Sapajou (*Cebus capucinus*).

SAPID, a. *săp'ĭd* [F. *sapide*, having taste or flavor—from L. *sapĭdus*, savory—from *sapĭō*, I taste]: tasteful; palatable; that affects or stimulates the palate. SAP'IDNESS, n. *-nĕs*, or SAPIDITY, n. *să-pĭd'ĭ-tĭ*, taste; the quality of affecting the organs of taste.

SAPIENT, a. *sā'pĭ-ĕnt* [L. *sapĭens* or *sapĭen tem*, wise—from *sapĭō*, I taste, I have sense or discernment: It. *sapiente*]: wise; sagacious; characterized by wisdom or discernment—almost always used in an ironical sense; would-be wise. SA'PIENTLY, ad. *-lĭ*. SA'PIENCE, n. *-ĕns*, wisdom; knowledge—used in an ironical sense.—SYN. of 'sapient': wise; knowing; sage; sagacious; discerning.

SAPIENTIA, n. *sā-pĭ-ĕn'shĭ-a* [L.]: wisdom. *O Sapientia* is an entry in the Anglican calendar under Dec. 16, which has been retained from pre-Reformation times. These two words are the commencement of the first of the series of seven greater antiphons for the Magnificat.

SAPINDACEÆ, *săp-ĭn-dā'sē-ē:* natural order of exogenous plants, consisting of trees and twining shrubs furnished with tendrils, and of a few herbaceous climbers. Their leaves are often marked with lines or pellucid dots. The flowers are in racemes or racemose panicles, hermaphrodite or unisexual. The calyx is 4–5-partite, or consists of 4–5 sepals. The petals are 4–5, occasionally lacking, hypogynous, usually having an appendage in the inside. The stamens are usually 8–10; often inserted into the disk, which is fleshy and sometimes glandular. The ovary is generally 3-celled, the cells containing one or

few ovules. The fruit is fleshy, or *samaroid*, or capsular. The order contains about 380 known species, natives of warm climates, especially of S. America and India; none natives of Europe, though the HORSE-CHESTNUT (q.v.) is now as well known in many parts of Europe as most of its native trees. It abounds in parts of N. America; and there is a probable hybrid, the Red Horse-chestnut (*Æsculus rubicunda*). The other N. Amer. species of the family include the Bladder-nut, Balloon-vine, the many Buckeyes and Maples. The timber of some species is valuable, particularly of *Pteroxylon utile* and *Hippobroma alatum*, natives of the Cape of Good Hope, the former known there as *Nieshout*, and the latter as *Pardepis*. Some are used in medicine as astringents. Narcotic and poisonous properties are very generally developed—also a saponaceous principle, especially in the genus *Sapindus* (see SOAPBERRY). Yet GUARANA (q.v.) BREAD is made from the seeds of a species of this order; the leaves of another (*Cardiospermum halicacabum*) are used as a boiled vegetable in the Moluccas; and the fruits of some species are excellent food.

Sapindus Saponaria.

SAPLING, SAPLESS: see under SAP 1.

SAPODILLA, n. *săp'ō-dĭl'lă* [F. *sapotillier:* Sp. *sapotilla:* Mexican, *zapotl*]: tree and its fine large fruit, native of the W. Indies and S. America; the *Achras sapota*, and other species of *Achras*, a genus of nat. order, *Sapotăcĕæ* (q.v.) The fruit is often called S. Plum. The seeds are aperient and diuretic, but an overdose is dangerous. The pulp of the fruit is subacid and sweet, and much esteemed for dessert in the W. Indies. The fruit of *Achras mammosa* is called MARMALADE. The NASEBERRY, also of the W. Indies, belongs to this genus.

Sapodilla (*Achras sapota*).

SAPONACEOUS, a. *săp-ō-nā'shŭs* [F. *saponacé*, saponaceous—from L. *sapo* or *sapōnem*, soap: It. *saponaceo*]: soapy; having the qualities of soap; feeling like soap to the touch. SAPONIFY, v. *să-pŏn'ĭ-fī* [L. *sapo*, soap; *facĭō*, I make]: to convert into soap; to combine to form soap. SAPON'IFYING, imp. SAPON'IFIED, pp. *-fīd*. SAPON'IFICA'TION, n. *-fĭ-kā'shŭn*, conversion into soap (see OILS: SOAP MAKING). SAPONIN, n. *săp'ō-nĭn*, peculiar substance obtained from various plants (see below). SAP'ONULE, n. *-nūl*.

an imperfect soap formed by the action of an alkali upon an essential oil.

SAPONIN, *săp'ō-nĭn* ($C_{35}H_{54}O_{18}$): vegetable principle in various plants, e.g., *Saponaria officinalis*, or Soapwort, *Polygala Senega*, several varieties of *Lychnis*, fruit of the horse-chestnut, etc. It is readily extracted from the root of soapwort by means of boiling alcohol, which, as it cools, deposits the S. as an amorphous sediment. It derives its name from its behavior with water, in which it is soluble in all proportions, yielding an opalescent fluid which froths when shaken, like a solution of soap, if even $\frac{1}{1000}$ part of S. be present. Its solution, or an infusion of soapwort, is sometimes used instead of a solution of an alkaline soap, for cleansing finer varieties of wool from grease.

SAPOR, n. *sā'pŏr* [L. *sapor*, taste, relish—from *sapĭō*, I taste]: taste; savor; relish; power of affecting palate or taste. SAPOROUS, a. *săp'ō-rŭs*, having taste; savory. SAP'OROS'ITY, n. *-ŏs'ĭ-tĭ*, the quality in a body by which it excites the sensation of taste. SAP'ORIF'IC, a. *-rĭf'ĭk* [L. *facĭō*, I make]: giving taste or flavor.

SAPOTACEÆ, *săp-ō-tā'sē-ē:* natural order of exogenous plants, consisting of trees and shrubs, often abounding in milky juice. The leaves are leathery, entire, and without stipules. The flowers are axillary; calyx is regular, persistent, generally with five divisions; corolla monopetalous, hypogynous, deciduous, regular, its segments usually equal in number to those of the calyx, rarely twice or thrice as many. The stamens are inserted on the corolla, fertile ones generally as many as the segments of the calyx, and generally with alternate sterile ones. There is no disk. The ovary is superior, with several cells, each cell with one ovule. The fruit is fleshy; the seeds nut-like, sometimes cohering; the *testa* bony and shining, with a very long, opaque, and softer scar on the inner face.—There are considerably more than 200 known species, natives chiefly of the tropics, and the remainder of sub-tropical countries. One of the most recently discovered species is also already one of the most important, *Isonandra gutta*, which produces GUTTA-PERCHA (q.v.).—The fruits of some are pleasant for eating, e.g., SAPODILLA (q.v.), and other species of the genus *Achras;* the STAR APPLE, and other species of *Chrysophyllum* (q.v.); different species of *Mimusops; Imbricaria Malabarica* and *I. maxima;* various species of *Lucuma*, etc. The genus BASSIA (q.v.) contains species valuable for the oils which they yield. The seeds of *Mimusops elengi* also yield oil abundantly.—In Gray's *Field Book of Botany*, the *Brumeliaceæ* is made the Sapodilla family, and includes our *Brumelia*, shrubs and small trees with cherry-like purple or blackish fruit; Va. to Ill., and south.

SAPPAN WOOD: see SAPAN WOOD.

SAPPERS: see under SAP 2.

SAPPHIC, a. *săf'fĭk:* pertaining to *Sappho*, an anc. Grecian poetess: pertaining to a Greek metre.

SAPPHIRE, n. *săf'fēr* or *-fīr* [L. *sapphīrus*; Gr. *sappheiros*; Heb. *sappír*, a sapphire]: precious stone of great hardness and beauty. SAP'PHIRINE, a. *-fer-īn*, resembling sapphire: N. mineral resembling the sapphire, and of pale-blue color.—The *Sapphire* is a gem excelled in value by no precious stone except diamond, and regarded as a variety of Corundum (q.v.), highly transparent and brilliant. It is sometimes colorless, and this kind, called *White S.*, is sold sometimes as diamond. It more frequently exhibits exquisite color, generally bright red or beautiful blue; more rarely, gray, white, or green. The red variety is the Oriental Ruby (q.v.) of lapidaries; the blue is that commonly from ancient times called S. It is found crystallized, usually in six-sided prisms, terminated by six-sided pyramids; and occurs sometimes imbedded in gneiss, but more frequently in alluvial soils. It is found at Bilin in Bohemia, and Expailly in Auvergne, but more abundantly in parts of the East. Ceylon is famous for its rubies and its sapphires, the latter the more abundant. They occur with garnets and other minerals, in a stratum of water-worn pebbles firmly imbedded in clay, in which are occasional lumps of granite and gneiss. But they have not yet been sought in their original situation in the mountain rocks. A piece of S. dug out of the alluvium within a few miles of Ratnapoora, 1853, was valued at more than $20,000. In the placer-ground between the Ruby and Eldorado bars of the Missouri river, sapphires of inferior quality have been found; and at Corundum Hill, Macon co., N. C., about 100 good sapphires and rubies were found 1870–80: but the mining of the corundum gems is nowhere in the United States carried on systematically. The S. was one of the stones in the breastplate of the Jewish high-priest. Among the Greeks, it was sacred to Jupiter.—The name *Girasol S.* is given to a beautiful variety with pinkish or bluish opalescence and peculiar play of light. The *Chatoyant S.* has more pearly reflections. The *Asteria S.* has in the midst a star of six bright rays, resulting from its crystalline structure.

SAP'PHIRE D'EAU: see IOLITE.

SAPPHO, *săf'fō:* one of the great poetesses of the world, and, with Alcæus, chief representative of the Æolian school of lyric poetry: about the end of B.C. 7th c. and beginning of B.C. 6th c.; b. in Lesbos, prob. at Mitylene; though she seems to have long been confused with a courtesan of the same name, b. at Eresos in Lesbos. She was only six years old when she lost her father Scamandronymus. She was contemporary with Alcæus, Stesichorus, and Pittacus, with the first of whom she had relations of friendship, as is seen in the surviving lyrics of both. All that we know of her is contained in some obscure references in one or two writers. Her famous plunge into the sea from the Leucadian rock, on finding her love for Phaon unrequited, is now adjudged by critics generally an invention of later times. At Mitylene, she is supposed to have been the centre of a literary coterie, all of them women, and

most of them her pupils in the art of poetry. Her moral character has been the subject of controversy in modern times; the most recent disputants being Bergk and Col Mure and F. G. Welcker of Bonn, who, in *Rheinische Museum* (1857–8), appeared, Mure for the prosecution, and Welcker for the defense. It remains doubtful whether S. was a model of virtue; but there is no proof that she fell below the standard usual in her country and her times; and critics are agreed that the poets of the Middle Comedy have covered her name with scandalously untruthful caricature. To whatever opinion on this subject we may incline, there is no question of her high lyrical genius, which was the admiration of antiquity from Solon downward, so that, as Homer was spoken of as 'the poet,' S. was termed 'the poetess.' Every line shows perfect finish, and full command of all poetical resources. One or two of her odes have been pronounced matchless. Of the nine books of her poems, only fragments remain to us. The best text is in Bergk's *Poetæ Lyrici Græci* (1854); the best separate ed. is Neue's (1827).

SAPPINESS, SAPPY, SAP-WOOD: see under SAP 1.

SAPPORO, *sâp-pō'râ:* city in Japan, cap. of the division in which Yezo and the Kurile Islands are included; built on both sides of the Toyohira river, 10 m. from the Sea of Japan, 11 m. from the Ishikari river. Except the govt. buildings, which resemble those of the United States, most of the structures are in the native architecture. The climate is good, there is abundant water-power, factories have been established, good roads constructed, and machinery introduced. American enterprise has done much to build up the city.—Pop. about 56,000.

SAPROGENOUS, a. *să-prŏj'ĕn-ŭs* [Gr. *sapros*, putrid, and root of *gennaō*, I engender]: produced by or in connection with putridity.

SAPROPHAGOUS, a. *sa-prŏf'a-gŭs:* feeding on decomposed or putrid substances.

SAPROPHYTE, n. *săp'rō-fīt* [Gr. *sapros*, rotten; *phuton*, a plant]: one of certain fungous plants, various bacteria, etc., living on dead organic matter. These micro-organisms, non-virulent and always present in animal intestines, may in certain conditions become virulent poisons. SAPROPHYTISM, n. *sa-prŏf'ĭt-ĭzm*, the state of living on decayed vegetable matter.

SAP-SUCKER, n. *săp'sŭk-ẽr:* a popular name for two species of woodpecker—*Picus villosus*, the hairy woodpecker, or larger sap-sucker, and *P. pubescens*, the downy woodpecker, or lesser sap-sucker.

SAPUCAIA NUT, *săp-ô-kī'yâ nŭt:* seed of *Lecythis ollaria*, lofty tree, plentiful in forests of n. Brazil; of nat. order *Lecythidaceæ*. The fruit is urn-shaped, as large as a child's head, and opens by a lid which falls off. Each fruit contains a number of seeds or nuts, as in the allied Brazil nut. The flavor is finer than that of the Brazil nut, though, hitherto, the S. N. is much less common in the shops of northern countries. Its form is oval, somewhat pointed at both ends, which are slightly bent in opposite

directions. Monkeys are very fond of the S. N., and are sometimes caught in consequence of thrusting the hand into a capsule, and not being able to withdraw it when filled with a nut, which they obstinately refuse to release.

SARABAND, n. *săr'a-bănd* [F. *sarabande*—from Sp. *zarabanda*]: originally a slow dance used in Spain, said to be of Saracenic origin; hence a short piece of music, of deliberate character, with peculiar rhythm, in ¾ time, the accent on the second crotchet of each measure. The S. is frequent among the *suites* or series of short pieces by Handel, Sebastian Bach, and other old masters, for the harpsichord or clavichord.

SARACEN, n. *săr'ă-sĕn* [It. *Saracino;* F. *Sarrasin;* L. *Saracēnus*, a Saracen—from Ar. *Sharkeyn*, the eastern people--from *sharg*, the east]: an Arabian; a Mussulman. The name Saracens is variously employed by mediæval writers to designate the Mohammedans of Syria and Palestine, the Arabs generally, or the Arab-Berber races of n. Africa who conquered Spain and Sicily and invaded France. At a later date, it was employed as a synonym for all infidel nations against which crusades were preached, and was thus applied to the Seljuks of Iconium, the Turks, and even to the pagan Prussians. The true derivation of the word was long a puzzle to philologers; Du Cange deduced it from Sarah, the wife of Abraham—an opinion coincided in by the mediæval Christian authors; Hottinger (*Biblio. Orient.*), from the Ar. *saraca*, to steal; Forster (*Journey*), from *sahra*, a desert; while others strove to see its origin in the Hebrew *sarak*, poor; but the opinion now prevalent (though not accepted by all authorities) is, that the word was originally *Sharkeyn* or *Sharakyoun*, etc. (Ar. 'eastern people'), corrupted by the the Greeks into *Sarakenoi*, from which the Romans derived their word *Saraceni*. The epithet Sarakenoi was applied by the Greek writers (from the 1st c. of the Christian era) to some tribes of Bedouin Arabs in e. Arabia. Pliny and Ammianus place the S. in Arabia Petræa and Mesopotamia, on the common frontier of the Roman and Persian empires; and the description of them by the latter, a most painstaking and accurate historian, coincides, in every important particular, with what is known at the present day of the Bedouin tribes of those regions. SAR'ACEN'IC, a. *-sĕn'ĭk*, or SAR'ACEN'ICAL, a. *-ĭ-kăl*, pert. to the inhabitants of Arabia; possessing the characters of that species of decorative art and architecture introduced into Europe by the Arabs or Saracens: see ARABIAN ARCHITECTURE. SARACEN'S HEAD, frequent bearing in heraldry; represented as the head of an old man with a savage countenance.

SARAGOSSA, *sâ râ-gŏs'sâ*, MAID OF: woman, named Augustina, who in early life sold cool drinks to soldiers, and who fought with great courage in the Spanish army at the siege of Saragossa by the French 1809. She was promoted lieut., received several decorations, and was celebrated by Byron in *Childe Harold*. She died at Ceuta Spain, 1857.

SARAGOSSA, *sâ-râ-gŏs'sâ*, or ZARAGOZA, *thâ-râ-gō'thâ:* city of Spain, cap. of the province of S., and formerly of the kingdom of Aragon. It stands on the Ebro, here a muddy stream which divides the city into two parts and is crossed by a noble stone bridge built 1437. The city has an imposing appearance from a distance, being adorned with numerous slender towers and spires; but the traveller, entering, finds it full of narrow winding lanes, instead of streets, though the houses—of brick—are solid structures, and many of them are the palaces of a nobility who have ceased to reside here. These buildings, rich in finely carved decorations and magnificent cornices, are now inhabited mostly by rude agriculturists; their spacious courts converted into farm-yards, and filled with dung-heaps. Everything about the city indicates decay and poverty. S. was the Celtiberian *Salduba,* but received the new name *Cæsarea Augusta* B.C. 25, of which the name S. is a corruption. It was a place of importance under the Romans, but there are few remains of the Roman city. S. was one of the first cities of Spain in which Paganism was generally renounced and Christianity adopted; it afterward became rich in relics, to which miraculous powers were ascribed. It was taken by the Moors in the 8th c., and recovered from them 1118, after a siege of five years, during which great part of the inhabitants died of hunger. It was taken by the French 1809, after a siege of eight months, and one of the most heroic defenses in modern warfare: see PALAFOX. S. has a univ., founded 1474. It has two cathedrals, both interesting as specimens of architecture; but the older is in a simple and severe style; the modern one—*Nuestra Senora del Pilar*—is very ornate. The latter cathedral boasts of a pillar on which the Virgin descended from heaven A.D. 40—an event so strongly attested, that Diego de Astorga, primate of Spain, 1720, Aug. 17, excommunicated all who even questioned it. Pilgrims flock from all neighboring parts of Spain to this pillar and the image of the Virgin, which came down from heaven. S. suffered grievously at the hands of the French 1809, and lost most of its treasures of art. It has considerable trade in agricultural produce, mostly on the Ebro; and manufactures of silks, woolens, and leather. Pop. (1887) 84,577; (1887) 92,407; (1900) 99,118.

SARAKHS, *sâ-râchs':* fortified post in Persia, on the Tajand river; important as being on the boundary between Persia and the Russian province of Turkestan; lat. 36° n., long. 61° 30′ e. The traveller De Blocqueville found here (1860) a recently constructed fort, with strong walls and a ditch. Sir Charles Macgregor describes the fort as 'immense' (1879), with armament of 11 guns, garrison of 700 infantry and a few horsemen. A Russian engineer, Lessar (1882), found in the fort a battalion of Persian infantry: the armament consisted of 6 old guns; and the gunners were neither drilled nor exercised.

SARANAC LAKES, *săr'a-năk:* Franklin co., in the Adirondack region, N. Y.; consisting of the Upper Saranac and Lower Saranac. These lakes are connected, but the Upper is about 5 m. w. of the Lower. The latter is about 8 m. n. of Mt. Seward, receives its water from the Upper Saranac and Round Lake, and is the source of Saranac river. The Upper, and larger lake, is about 8 m. long, with average width of 2 m.; 1,567 ft. above sea-level. The region of these lakes is much frequented by summer tourists.

SARANSK, *sâ-rânsk':* town of European Russia, province of Penza, 80 m. n. from Penza, at the confluence of the Saranga and Insara, feeders of the Sura. Pop. (1880) 13,438; (1895) 13,921.

SARA'PIS: see SERAPIS.

SARASWATÎ, *săr-ăs-wăt'ē,* Hind. *sŭr-ŭs-wŭt'ē,* in Hindu Mythology: wife, or female energy, of the god Brahman, the first of the Hindu Trimûrti or triad. She is also the goddess of speech and eloquence, of music and the arts, and inventor of the Sanskrit language and the Devanâgarî letters. She is called also *Bhâratî;* also *Mahâs'wetâ* or *Mahâs'uklâ* [from *mahat,* great, and *s'weta* or *s'ukla,* white].

SARATO'GA, BATTLE OF: series of fights and movements, 1777, Sep. 19, Oct. 7, 11, and 12, which compelled a British army under Burgoyne to surrender to the American army under Gates, Oct. 17. The two pitched battles which led to this were on Sep. 19 and Oct. 7, near Stillwater, N. Y., where the American army had encamped, Sep. 12, on Bemis's Heights, a spur of hills jutting out nearly to the Hudson river; while the army of Burgoyne had crossed from the e. side of the Hudson, at Schuylerville, higher up, and encamped within six m. of the American force. It was after these defeats that Burgoyne retreated Oct. 8 at night, and in the night of Oct. 9, to Saratoga, where he made his last stand. After an American brigade, at daybreak Oct. 11, had broken up the British posts at the mouth of Fish creek, and captured all their boats and all their provisions except a short allowance for five days, Burgoyne found his army, Oct. 12, completely invested, and every spot in his camp exposed to rifle-shot or cannon. Oct. 13, accordingly, a council of the corps commanders unanimously advised asking for honorable terms of surrender. Gates met this by a demand for unconditional surrender, but granted more favorable terms Oct. 15, in fear that the British forces on the Hudson would come up with succor. The captured British army was promised departure from Boston to Great Britain, under parole not to serve again against the Americans; and officers were allowed their horses, carriages, and baggage free from search. These terms were not ratified by congress; and, except the higher officers, the army were held as prisoners till the end of the war. The articles were signed Oct. 17; and 5,781 men, including officers, laid down their arms. There had been taken prisoners 1,856.

and fully 300 of Burgoyne's men had deserted. The Americans got 35 pieces of the best ordnance then known, many munitions of war, and more than 4,000 muskets. A remarkable feature of this grand success, the effect of which on the American cause was beyond estimate, was the extent to which the separate bodies of American troops and their commanders did the work. Gates, who had displaced Schuyler in chief command Aug. 19, did not appear in the field. Daniel Morgan, of Va., with 500 picked riflemen, sent by Washington on the order of congress to the aid of Gates, was foremost in counsel, conduct, effective leadership, and courage on the field of battle. The battle of Sep. 19, which irretrievably crippled Burgoyne's force, was a splendid effort of the American husbandmen of New England, N. Y., Penn., Md., and Va. That of Oct. 7, which drove Burgoyne to desperation, was equally a battle of the men and their immediate officers. With Bunker Hill and Trenton, Saratoga is one of the grandest memories of the revolution.

SARATO'GA SPRINGS: town in Saratoga co., N. Y.; on the Fitchburg, the Delaware and Hudson Canal Co.'s, the Saratoga Mt. McGregor and Lake George, and the Adirondack railroads; 36 m. n. of Albany, 186 m. n. of New York. It is one of the oldest and most popular summer-resorts in the United States, and is noted for its cathartic, alkaline, iron, sulphur, and magnetic mineral springs. The efficacy of some of the springs was known to the Indians before the days of white settlements. There are more than 40 springs in and about the town, of which Congress, Hathorn, Empire, Geyser (spouting), High Rock (first visited by whites 1767), Excelsior, Star, Columbian, Vichy, Champion, Hamilton, Washington, and White Sulphur are the most important. The town is beautifully laid out, and, besides the springs, has for attractions Congress Spring Park, Woodlawn Park, race-course and club-house of the Saratoga Assoc. for Racing, Saratoga Lake (4 m. e.), the Saratoga battle-field (12 m. s.e.), and excellent drives and promenades. Of more than 30 hotels, the United States, Grand Union, Congress Hall, Clarendon, Windsor, Kensington, Columbian, American, Worden, and Adelphi are the largest; and there are about 60 boarding-houses. The town is lighted by electricity, and has a town hall (cost $130,000), churches, public and private schools, Temple Grove seminary, a public school library and others, and several charitable institutions. The patent for the site of S. S. was sold to private parties in Albany 1684; the first white settlement was made 1773; the town was incorporated 1819; and it was made a post-office 1826. A large business is done in bottling the mineral waters. Pop. permanent (1870) 7,516; (1880) 8,421; (1890) 11,975; (1900) 12,409; (1910) 12,693.

SARATOV, *sâ-rä-tŏv'*: government in s.e. Russia; bounded e. by the river Volga; 32,624 sq. m. In 1850 the territory *east* of the Volga, formerly part of S., was erected into the govt. of Samara (q.v.). Nearly half the area of S. is waste land. A number of German colonists settled here 1765

—75, and distinguished themselves by persevering industry in cultivation of the soil. Their descendants have became an important element of the population. Cattle-breeding is carried on extensively; fishing is of considerable importance.—Pop. 2,419,884.

SARATOV′: city of Russia, cap. of the govt. of S.: on the right bank of the Volga, 460 m. (432 m. by rail) s.e. of Moscow. The river is rapidly shoaling here; but the city, with railway-communication, is increasing in pop. and in importance. Across the river is the suburb Pokrovskaya, with pop. about 20,000. Pop. of S. apart from the suburb (1882) 112,430; (1900) 138,000. Though its houses are generally of timber, the town has a rich and picturesque appearance. Its 27 churches are ornamented with numerous towers and cupolas; and its broad streets, from the character of the houses and of the elegant equipages that pass through them, have quite a European appearance. It manufactures pottery, bricks, tobacco, silk, hosiery, etc.

SARAWAK, *sâ-râ-wâk′*: kingdom on the n.w. coast of Borneo; bounded s. and w. by Sambas, e. by Brunai, n. by the Bight of Datu; 35,000 to 40,000 sq. m. The coast stretches from the w. of Cape Datu, lat. 2° n., long. 109° 55′ e., to the e. of the river Samerahan, long. 111° 3′ e.—nearly 70 m. The Sarawak is the most important river; it has two navigable mouths in the Bight of Datu. Other rivers are the Rejang (navigable 120 m. for vessels of more than 1,000 tons), the Lundu, Samerahan, and Sadang. A chain of mountains, 3,000 ft. in height, rises in S., and along the frontier are altitudes of 4,000 to 8,000 ft. Sandstone and granite are prevailing rocks. In parts, the soil is clayey; in others, a rich mold. Except some cultivated spots, the surface is covered with forests, which abound with wild swine, harts, and a variety of monkeys. There is excellent coal near the river Sadang. Antimony ore, easily worked and shipped, is obtainable in any quantity; copper and gold have been found, and iron ore is plentiful at Lundu. Fine timber trees, e.g., iron-wood, ebony, sandal-wood, teak, and trees adapted for ship-building, grow near the mouths of the rivers. There grows also the valuable Camphor Tree (*Dryobalanops aromatica*).

The climate is not considered unhealthful. Much rain falls from Sep. to March, and the thermometer usually indicates about 83° F. Edible nests, wax, and aromatic woods are collected by the Dyaks for the Singapore market, and the plains are well adapted for growth of rice and sago. The chief exports are gutta-percha, sago flour, antimony ore, and edible birds' nests; total value yearly $1,145,248: imports, chiefly cloth, tobacco, brass-ware, opium, rice, and cocoa-nut oil, $1,183,255. The trade is mostly with Singapore. The exportation of antimony and sale of opium are monopolized by the govt., and, with a small head-tax, form the chief revenue.

The original inhabitants are Dyaks, divided into about 20 tribes, and speaking different dialects; they are, for savages, mild, industrious and honest. Malays live on the

coast, and the mines are worked by Chinese. From 1841 to 68, S. was governed by Sir James Brooke (q.v.), as an independent rajah. Sir James was succeeded by his son. The rajah is an absolute sovereign, but has a legislative council of natives and Europeans. Even on the testimony of the Dutch, who view with jealousy the increased influence of the British on that coast, the new rule has done much to suppress piracy and promote the civilization and prosperity of the people.

The seat of govt. is the town of Sarawak, formerly called Kutjing, about 18 m. from the mouth of the river, which is navigable for large ships. Mission-stations and schools have been erected (pop. 12,000).—Pop. of kingdom, about 250,000.

SARCASM, n. *sâr'kăzm* [F. *sarcasme*—from L. *sarcas'mus;* Gr. *sarkas'mos*, a sarcasm—from Gr. *sarkazō*, I strip the flesh from the bones, I sneer—from *sarx* or *sarka*, flesh: It. *sarcasmo*]: a keen, reproachful, cutting expression; a taunt or gibe. SARCASTIC, a. *sâr-kăs'tĭk*, or SARCAS'TICAL, a. *-tĭ-kăl*, bitterly satirical or ironical; taunting. SARCAS'TICALLY, ad. *-lĭ*.—SYN. of 'sarcasm': irony; ridicule; gibe; taunt; satire; jest.

SARCE: see SEARCE.

SARCEL, n. *sâr'sel* [F. cerceau—from L. *circellus*, dimin. from *circus*]: one of the extreme pinion feathers in a hawk's wings.

SARCELLED, a. *sâr'seld*: in *her.*, cut through the middle.

SARCENET, n. *sârs'net* [OF. *sarcenet* Saracen's silk—from mid. L. *saracēnĭcum*, sarcenet (see SARACEN)]: a fine, thin, woven silk, used for ribbons, linings, etc.

SARCINA, *sâr-sī'nâ*, or SARCINULA, *sâr-sĭn'u-lâ* [L. *sarcina*, package]: genus of minute plants of very low organization, reckoned sometimes among *Algæ*, sometimes among *Fungi*. A number of forms or species are known. The first discovered, *S. ventriculi*, was observed originally by Goodsir in matters vomited from the human stomach. It is of a roundish quadrangular form, about 1/00 to 1/120 of a line in diameter; the individuals generally grouped in cubes of 4, 16, or 64 in the cube, separated by rectangular striæ. Although the most common seat of sarcinæ is the human stomach, they have been detected in the stomach of the tortoise, the rabbit, the dog, the ape, and in the cæcum of the fowl; in the urine, in a considerable number of cases; in the lungs; in the fæces and intestinal canal; in the fluid of the ventricles of the brain; in cholera stools; in the fluid of hydrocele; in the bones; and Dr. Lowe has

Sarcina Ventriculi, magnified 1,000 diameters.

Copied from the *Micrographic Dictionary*, Lond., Van Voorst.)

noticed their existence in stagnant water. It appears from the measurements of Welcher that the sarcinæ in urine are about half the size of those occurring in the stomach, also the aggregations of cells are smaller.

The occurrence of the sarcina in the urine, the fluid of the ventricles of the brain, etc., is probably a *post-mortem* phenomenon of little diagnostic or pathological importance. Its appearance in vomited fluids is, however, characteristic of a peculiar and important form of dyspepsia. The vomited matter in these cases has a faint acid smell, like that of fermenting wort, and is obviously in a state of fermentation. After standing a few hours, it becomes covered with a thick, brownish, yeast-like froth, and deposits a brown, flaky sediment. On examining the froth and the deposit under the microscope, sarcinæ are found in great abundance, together with the torulæ characteristic of yeast (q.v.). The fluid is always acid, if sarcinæ are present. The amount of vomited matter is always large, sometimes enormous. It is usually ejected in the morning, after a night spent awake from a sense of heat, gurgling, and distention in the epigastric region; and its discharge gives almost immediate relief. Dr. Budd, one of the highest authorities in diseases of the stomach, believes that the disease consists, primarily and essentially, in some organic change, which prevents that organ from completely emptying itself, and which causes a secretion from its coats, capable, when mixed with food, of undergoing or exciting a process of fermentation; and that the development of the sarcinæ bears to this process, or to some stage of it, the same relation which the development of torulæ bears to simple alcoholic fermentation. The well-known power of sulphurous acid in checking the fermentative process induced Prof. Jenner to try in this disease the effect of sulphite of soda—a salt which readily yields its sulphurous acid; and experience has confirmed the accuracy of Jenner's induction; for this salt, administered soon after a meal, or when the fermenting process is commencing, in doses varying from 10 grains to a dram, dissolved in water, is the most effectual remedy at present known. The hyposulphite of soda, in somewhat larger doses, has similar action.

SARCIN, n. *sârs'ĭn* [Gr. *sarx* or *sarka,* flesh]: nitrogenous substance ($C_5H_4N_4O$) obtained from muscular tissue, and from various glandular organs, as the liver and the spleen. It is produced also during putrefaction of proteids. Sarcin crystallizes in needles, and forms compounds both with acids and with bases. It is also known as Hypoxanthin.

SARCOCARP, n. *sâr'kō-kârp* [Gr. *sarx* or *sarka,* flesh; *karpos,* fruit]: in *bot.*, the fleshy part of certain fruits, usually that eaten—also called SARCODERM.

SARCOCELE, n. *sâr'kō-sēl* [Gr. *sarx* or *sarka,* flesh; *kelē,* a tumor]: a fleshy and firm tumor on a testicle.

SARCOCOL, n. *sâr'kō-kŏl*, or SAR'COCOL'LA, n. *-kŏl'lă* [Gr. *sarx*, flesh; *kolla*, glue]: a semi-transparent solid substance resembling gum-arabic, imported from the east and northern part of Africa, said to be the produce of the *Penœa sarcocolla* and other species, ord. *Penœăcĕœ*.

SARCODE, n. *sâr'kōd* [Gr. *sarkōdēs*, fleshy—from *sarx* or *sarka*, flesh; *eidos*, resemblance]: a term applied to the substance which constitutes the body or vital mass of the protozoa or lowest forms of animal life; animal protoplasm.

SARCODERM, n. *sâr'kō-dĕrm* [Gr. *sarx* or *sarka*, flesh; *derma*, skin]: the fleshy covering of a seed, lying between the internal and external covering—also called SARCOCARP.

SARCOLEMMA, n. *sâr'kō-lĕm'mă* [Gr. *sarx*, flesh; *lemma*, skin, rind]: in *anat.*, proper tubular sheath investing each primary muscular fibre. See MUSCLE.

SARCOLINE, a. *sâr'kō-lĭn* [Gr. *sarx* or *sarka*, flesh]: flesh-colored.

SARCOLITE, n. *sâr'kō-līt* [Gr. *sarx*, flesh; *lithos*, a stone]: a stone of a rose-flesh color.

SARCOLOBEÆ, n. plu. *sâr'kō-lō'bē-ē* [Gr. *sarx*, flesh; *lobos*, a lobe]: in *bot.*, thick and fleshy cotyledons, as in the bean and pea.

SARCOLOGY, n. *sâr-kŏl'ŏ-jĭ* [Gr. *sarx* or *sarka*, flesh; *logos*, a discourse]: the division of anatomy which treats of the soft parts of the body. SARCOLOGICAL, a. *sâr'kō-lŏj'ĭ-kăl*, pertaining to sarcology. SARCOL'OGIST, n. *-jĭst*, one versed in sarcology.

SARCOMA, n. *sâr-kō'mă* [Gr. *sarkoma*, a fleshy excrescence—from *sarx* or *sarka*, flesh]: a firm fleshy tumor composed of a tissue resembling connective tissue in the embryo; it is usually malignant in character and constitutes one of the forms of cancer. SARCOMATOUS, a. *sâr-kō'mă-tŭs*, affected with, or disposed to having, fleshy tumors.

SARCOPHAGUS, n. *sâr-kŏf'à-gŭs* [L. *sarcoph'agus;* Gr. *sarkoph'agos*, flesh-devouring—from Gr. *sarx* or *sarka*, flesh; *phagein*, to eat]: any stone coffin or chest for a dead body; a stone tomb. The name originated in the property assigned to a species of stone, found at Assos in Troas and used in early times, of consuming or decomposing the whole body, except the teeth, within 40 days. The oldest known sarcophagi are those of Egypt, some of which are contemporary with the pyramids. The earliest are of square or oblong form, either plain, or ornamented with lotus leaves; the later are of the form of swathed mummies, and bear inscriptions. The Phœnician and Persian kings are buried in sarcophagi. The Roman sarcophagi of the earlier republican period were plain. Sarcophagi were occasionally used in the later republic, though burning had become the more general mode of

disposing of the dead. The use of stone chests for interment of distinguished persons has not been altogether discontinued in modern times. SARCOPH'AGOUS, a. *-ăgus*, feeding on flesh. SARCOPH'AGY, n. *-jĭ*, the practice of eating flesh. See CANNIBAL.

SARCOSINE, n. *sâr'kō-sĭn* [Gr. *sarx* or *sarka*, flesh]: a derivative of acetic acid.

SARCOSIS, n. *sâr-kō'sĭs* [Gr. *sarkōsis*, the growth of flesh—from *sarx* or *sarka* flesh]: the generation of flesh. SARCOTIC, a. *sâr-kot'ĭk*, that promotes the growth of flesh. SARCOUS, a. *sâr'kus*, having elements that produce flesh; of or pertaining to muscle or flesh.

SARCOSPERM, n. *sâr'kō-sperm* [Gr. *sarx* or *sarka* flesh; *sperma*, seed]: same as SARCODERM, which see.

SARD, n. *sârd*, or SAR'DIUS, or SARDOIN, *sâr'doyn* [Gr. *sardĭon* the sard or carnelian—so called from anc *Sardis*, cap. of Lydia in Asia Minor, where originally found]: brownish-red variety of chalcedony, of blood-red color by transmitted light, rare, and of much higher price than common carnelian: in general, carnelian. SARDACHATES, n. plu. *sâr'dă-kātz*, a name given by the ancients to varieties of agate, partaking of the nature of carnelian, or which contained layers of sard or carnelian; the flesh-colored agate when clouded and spotted. SAR'DEL n. *-del*, the sard. SAR'DINE, n. *-dĭn*, the sard, mentioned in Revelation. SAR'DIUS, n. *-dĭ-us*, the sard, a precious stone set in Aaron's breastplate.

SARDANAPALUS, n. *sâr'dăn-ă-pā'lus* [the luxurious and voluptuous king of Assyria, who is said to have perished by fire about B.C. 820]: one who lives retired in extravagant luxury, licentiousness, and effeminacy—said especially of a tyrant. See ASSYRIA.

SARDES, *sâr'des*,, or SARDIS, *sâr'dĭs*: anciently a city of Asia Minor, cap. of Lydia, in a fertile plain between the n. base of Mt. Tmolus and the river Hermus, about 60 m. e.n.e. of Smyrna. Through its *agora*, or market-place, flowed the Pactolus, tributary of the Hermus. The city is mentioned first by Æschylus. It was taken by the Cimmerians, in the reign of King Ardys (B.C. 680-631). In the reign of Crœsus, the last Lydian king, Sardes attained its highest prosperity. It became the residence of the Persian satraps after the overthrow of the Lydian monarchy. The Athenians burned it B.C. 503, and it afterward passed under the Romans, and was the seat of a separate provincial government. It was the seat of one of the Seven Churches mentioned in the Book of Revelation.—*Sart*, the modern Sardis, is a poor village, worthy of mention only for the ruins of the anc. city in the vicinity: of these, the chief are those of a stadium, of a theatre, and of the Acropolis.

SARDINE. See SARD.

SARDINE, n. *sär'dēn* [F. *sardine;* It. *sardina;* L. *sardina;* Gr. *sardinē*—so called from the island of *Sardinia*

near which it is caught, (*Clupea Sardina*): fish of the same genus with the herring and pilchard, smaller than the pilchard; abundant in the Mediterranean, and found also in the Atlantic Ocean, though not so far n. as the British shores. It is much esteemed for its flavor, and sardines preserved in oil are exported in large quantities from some Mediterranean ports. But the 'sardines' of the w. coast of France, largely exported to Britain, are generally not true sardines, but young sprats—the *garvies* of the Firth of Forth—and sometimes young herring.

Sardines appear in shoals on the coasts of the Mediterranean at particular seasons as herrings and pilchards on those of Britain. The sardine fishery on the coast of Provence is chiefly in May, June, and July; but the fishery for sprats, which are cured as sardines, and sold under that name in w. France, takes places in winter. About 1880, sardines disappeared from the coasts of Brittany, where they were estimated to be worth 15,000,000 francs (about $3,000,000) per annum to the fishermen.

They are exported to the most distant parts of the world; cured with oil in tin boxes, forming a much-esteemed delicacy and a wholesome food. To cure them in this way, they are first carefully washed in the sea, then sprinkled with fine salt; and after a few hours, the head, gills, etc., are removed; they are then washed again, and spread out on willow branches or wire-work, exposed to the sun and wind if the weather is dry; but in damp and rainy weather, to a current of air under cover. They are next put into boiling oil, in which they remain a short time; and when they are taken out, the oil is drained away from them as much as possible, and they are put into the familiar tin boxes. The boxes being filled with sardines, are filled up with oil, the lid is soldered on, and they are placed for a short time in boiling water, or exposed to hot steam. The boxes which have leaked or have burst in boiling are rejected, and those which remain sound are ready for the market.

In the United States a true sardine (*C. cœruleus*) occurs on the coast of California and, judging from the results attained in the canning of small quantities, it promises to rival the French product in delicate flavor and industrial importance. But the principal sardine industry of the United States centres about Eastport, Me., where the young of the herring is packed. These fish are caught chiefly in brush weirs (see POUND-NET FISHING) and are sold to the canneries, where they are treated in general after the French method with some local modifications. Drying rooms or ovens are employed in place of the open air; when ovens are used the fish are not boiled in oil, but are at once sealed; cottonseed-oil is almost universally employed instead of olive-oil; and various labor-saving devices have been introduced. The product is distinctly inferior to the best or even middle-grade French sardine. Various special grades, put up in

mustard, tomato sauce, and spices, are also packed. The output of the 45 canneries in Maine is about 550,000 cases, valued at about $2,000,000, annually.

SARDINIA, *sâr-dĭn'ĭ-a:* a former south European kingdom, comprising Sardinia and its surrounding islands as the nucleate portion with several dependencies on the Continent which included the duchy of Savoy, whence came its kings; the principality of Piedmont; the county of Nice; the duchy of Genoa, and parts of the duchies of Montferrat and Milan. These latter were divided for administrative purposes into eleven divisions—Turin, Genoa, Chambéry, Alessandria, Coni, Novara, Nice, Annecy, Ivrea, Savona, and Vercelli. Previous to the annexation of its territories consequent on the events of 1859, and the disjunction from it of the duchy of Savoy and the county of Nice, which, in the same year, were ceded to and now form part of France, it comprised in the whole an extent of 28,229 sq.m., with a population in 1858 of 5,194,807. In 1860 the revenue was estimated at 149,343,441 francs or $29,868,688, and the expenditure at 157,805,376 francs or $31,561,075. The national debt on Jan. 1, 1858, amounted to 677,020,228 francs or $135,404,046. The army in 1859 numbered 76,172 men, exclusive of the reserve; and the fleet consisted of 29 ships with 436 guns. A new constitution was voluntarily granted by Charles Albert in 1848. It appointed two legislative chambers, guaranteed the freedom of the press, and introduced many important reforms. The Roman Catholic was the religion of the state, but all other forms were tolerated. The last Sardinian king was Victor Emmanuel II., afterward king of Italy, who succeeded to the throne in 1849. The royal title was King of Sardinia, Cyprus, and Jerusalem, and Duke of Savoy. The crown-prince was styled Prince of Piedmont.

SARDIN'IA (Italian, *Sardegna*): island in the w. half of the Mediterranean, forming part of the Italian kingdom and separated from the island of Corsica by the Strait of Bonifacio, not quite 7 m. wide; length, 152 m.; central breadth, about 66 m.; area, 9,350 sq.m. The coast is in great part rugged and precipitous, and though the island is nearly in the form of a parallelogram there are some important indentations, such as the Gulf of Asinara in the n.w., the Bay of Oristano in the w., and the Gulf of Cagliari in the s.e., on which Cagliari, the capital of the island, is situated. The interior is generally mountainous; the chain which traverses Sardinia sends out branches e. and w., and culminates in Brunca, 6,291 ft., and Gennargentu, 6,132 ft. Between the mountain ridges are extensive plains or valleys. The streams are numerous, but unnavigable, the largest being the Tirso, which pours its waters into the Gulf of Oristano on the w. coast. In the vicinity of the coast are a series of lagoons. As regards the geological structure of the island crystalline rocks occupy a considerable area, in

which granite, overlaid by gneiss and micaschist, predominates, but sedimentary rocks are also well represented, as also volcanic formations, a number of ancient craters being traceable. The mineral riches of the island consist chiefly of lead, zinc, copper, quicksilver, antimony, and iron of excellent quality. Iglesias, near the w. coast, is the centre of the mining district. The other minerals are porphyry, alabaster, marble, lignite, etc. The climate is similar to that which obtains generally over the Mediterranean region. The range of the thermometer is between 34° and 90°, and the mean annual temperature 61° 7′. During the hot season an unhealthy malaria infects the low-lying tracts. The winter months are rainy, and the pleasantest season is in the autumn. Much of the land is of remarkable fertility. The principal crop is wheat; barley, maize, beans, etc., are extensively grown; the vine is well adapted both to climate and the soil; and olive-grounds are met with in various quarters. The rearing of live stock forms an important industry. Game of all kinds is very abundant. Wild boars, stags, deer, and mufflons frequent the woods and forests. The most valuable fishery is that of the tunny. Manufactures are chiefly confined to a few coarse tissues woven by the women at their homes for private use. The trade consists of the exports of corn, wine, brandy, timber, fish, cattle, lead ore, calamine, salt, etc.; the imports include cotton, colonial produce, hosiery, hardware, and metals, coal, etc. Railways now traverse the island. For administrative purposes Sardinia is divided into the two provinces of Cagliari and Sassari. The inhabitants are of Italian race, with a mixture of Spanish, and are characterized by a chivalric sense of honor and hospitality, but the family feud or *vendetta* still exists. Education is in a backward state, and civilization is rather primitive. The early history of the island is involved in obscurity. It was concerned in the struggles between Rome and Carthage, and often became the theatre of war, and suffered equally from both the powerful states which contended for its possession. At a very early period the inhabitants were converted to Christianity. They passed successively into the hands of the Vandals, the Goths, the Longobards, and Saracens. By the united efforts of the Genoese and Pisans the Saracens were ultimately expelled from the island, and then rival claims were set up for it by its liberators themselves. During the disputes that ensued some of the judges or governors succeeded in establishing themselves as independent princes. In 1297 Boniface VIII. invested the kings of Aragon with Sardinia, and it continued in the possession of Spain till 1708, when it was taken possession of by the British. In 1713, in terms of the Peace of Utrecht, it was yielded to Austria. In 1720 it was ceded by Austria to Victor Amadeus II., Duke of Savoy, in exchange for Sicily. The Duke of Savoy thereafter assumed the title of king of

Sardinia, which was finally exchanged in 1861 for that of king of Italy. Pop. (1881) 682,002; (1901) 791,754, giving a density of 85.08 per sq.m.

SARDINIAN, a. *sâr-dĭn'ĭ-ăn:* pertaining to the people or island of *Sardinia:* N. a native of Sardinia.

SARDONIC, a. *sâr-dŏn'ĭk,* or SARDO'NIAN, a. *-dō'nĭ-ăn* [supposed to be so called from the *herba Sardon'ĭa,* a plant of Sardinia, which is said when eaten to produce convulsive motion of the cheeks and lips as in laughter]: forced; heartless; ironical; fiendish—applied to laughter, smiles, or grins, as a *sardonic laugh,* by which is often intended a sarcastic laugh; but whose original application was to a convulsive horrible grin, the forced result of some diseases, e.g. tetanus. See RISUS SARDONICUS under RISUS.

SARDONYX, n. *sâr'dō-nĭks* [L. *sardŏnyx;* Gr. *sardŏnux,* a sardonyx—from the anc. Sardis, in Asia Minor, and *onux,* a nail—so named from its resemblance in color to the flesh under the finger-nail]: a precious stone, a variety of onyx, composed of alternate layers of sard and nearly opaque-white chalcedony, the most beautiful, the rarest, and the most valued form of onyx.

SARDOU, *sâr-dô',* VICTORIEN: dramatist: b. Paris, 1831, Sep. 7; d. Paris, 1908, Nov. 8. He studied medicine for a time, but financial embarrassments of his family compelled him to make a livelihood by teaching history and mathematics, and by writing for newspapers, etc. His first comedy, *La Taverne des Etudiants* (1854), was an utter failure. He was reduced to abject poverty 1857, and was nursed through an attack of typhoid fever by a neighbor, a Miss de Brécourt, whom he married 1858. He tried his hand again at dramatic composition, and before long had achieved fame and fortune. Of his numerous works—comedies, vaudevilles, *féeries,* comic operas, etc.—nearly every one has been received with favor at Paris, and many of them have been brilliantly successful on the British and the American stage. In the long list of titles are: *Les Pattes de Mouche* (1859); *Les Prés Saint-Gervais* (1862); *Nos Intimes* (1862); *Les Vieux Garçons* (1865); *Séraphine* (1868); *Patrie* (1869); *Le Roi Carotte* (1872), an *opéra bouffe,* set by Offenbach; *Rabagas* (1872); *L'Oncle Sam* (1873); *Ferréol* (1875); *Dora* (1877); *Les Bourgeois de Pont-d'Arcy* (1878); *Daniel Rochat* (1880); *Divorçons* (1880); *Odette* (1881); *Fédora* (1882); *Théodora* (1884); *La Tosca* (1887); *Cléopâtre* (1889); the series on the French Revolution, *Les Merveilleuses, Thermidor* (1891), and *Robespierre,* the last written for Sir Henry Irving; *Madame Sans-Gêne* (1893); *Gismonda* (1894); *Marcelle* (1896); *Spiritisme* (1897); and *Paméla, Marchande de Frivolités* (1898). Several of these from *Fédora* onward, were specially written for Sarah Bernhardt (q.v.). In his comedy, Sardou revealed rapid movement, witty dialogue, frequently clever satire on contemporary matters,

unconvincing character portraiture, loose construction and improbable episodes. His 'historical' dramas aim at the heroic, but are simply grandiose, their connection with authentic history is generally tenuous, their interest largely one of empty mechanical display. *Dante*, presented in the United States by Irving in 1903-4, suffered from a lack of coherence. Sardou's dramaturgic skill was great, but his works had no literary value. He was elected member of the French Acad. 1877.

SARGASSO, n. *sâr-găs'sō*, or SARGAS'SUM, n. *-sŭm* [Sp. *sargazo*, sea-weed]: the floating sea-weed of the n. Atlantic, covering large areas, known by the name SARGASSO SEA. See GULF-WEED.

SARGENT, *sâr'jĕnt*, EPES: 1813, Sep. 27—1880, Dec. 31; b. Gloucester, Mass. He studied at the Boston Latin School, and took a partial course at Harvard College; engaged in newspaper work in Boston; was on the editorial staff of the New York *Mirror* several years, but about 1846 again settled in Boston, and for some years was editor of the *Evening Transcript*. He wrote several plays, some of which were very successful; edited a series of reading-books for schools; was a contributor to the *Atlantic Monthly* and other magazines; assisted in the preparation of some of the Peter Parley books by S. S. Goodrich; and edited the lives and works of several British poets, the works of Franklin, and *The Modern Drama* (15 vols.). He also published three volumes of poems and some very popular fugitive pieces, miscellaneous works, and several novels and stories for young people. His *Cyclopædia of English and American Poetry*, completed a little before his death, was published 1883. He died at Boston.

SAR'GENT, HENRY: artist: 1770, Nov. 25—1845, Feb. 21; b. Gloucester, Mass.; son of Daniel S. After studying at an academy, he went to London, and for some time was pupil of Benjamin West. On his return he opened a studio in Boston, and was quite successful. He was adjt.gen. of Mass. 1814, and was afterward aide to Gov. Brooks and Gov. Strong. Sargent planned an elevated railroad. Among his most famous pictures were the *Landing of the Pilgrims*, which he gave to the Pilgrim Soc. at Plymouth (a reproduction of the original which was ruined by careless handling); *The Dinner Party, Christ's Entrance into Jerusalem; The Starved Apothecary; The Tailor's News;* a full length portrait of Peter Faneuil at Faneuil Hall, Boston; etc. He died at Boston.

SARGENT, JOHN SINGER: American painter: b. of American parents, Florence, Italy, 1856. He was educated in Italy, France, and Germany, and received his early art training under Carolus Duran. He was elected member of the Royal Academy of England in 1891 and of the National Academy of Design, New York, in 1897. He has lived abroad all his life and has never spent more

than a year in the country of his parents. Having had the advantage of being chosen by Carolus Duran as an assistant in the execution of important government commissions, he thoroughly mastered the secrets of French technique before adopting a method and style which are purely his own. His chief works are in portrait and genre. Among his portraits may be mentioned that of *Carolus Duran; General Leonard Wood; Mr. Joseph Jefferson; Major Francis Lee Higginson; Homer Saint Gaudens; President Roosevelt; Henry G. Marquand; William M. Chase; Carmencita; Ada Rehan.* His genres include: *Fishing for Oysters at Cancale; Neapolitan Children Bathing; El Jaleo.* His most ambitious and original works, however, are the decorations in the Boston Library, which include the now famous *Frieze of the Prophets.* As a painter his manner is French in brilliant versatility and epigram, but his treatment infinitely superior to the millinery effects of Duran and his school. His portraits reflect clearly the characteristics of his sitter and his intuition is so unerring in detecting the subtlest traits of individuality, that it has been said of one of his great portraits, 'It is more like Chase than Chase himself.' As a specimen of his wall-painting we may cite that portion of the Boston Library decorations known as the *Dogma of the Redemption.* It is divided into an upper and a lower panel which would seem to represent Heaven and Earth severally. In the upper panel are the three persons of the Trinity enthroned, with hands raised in blessing, the Father wearing the triple crown, or tiara; each enrobed in a flowing, cope-like garment. In the centre of this picture is set up the cross on which Christ is suffering, while Adam and Eve catch in chalices of gold the blood that drops from his hands. Below the foot of the cross is the pelican, symbol of self-sacrificing love. Above the arms of the cross runs the inscription *Remissa sunt peccata mundi* ('The sins of the world have been remitted'). Across the molding which separates the two divisions of the subject is a monkish distich

Factus homo factor hominis, factique redemptor,
Redimo, corporeus corpora, corda deus.
(I, man's maker, now made man, and redeemer of him I made,
God in flesh, redeem all human hearts and bodies.)

In the lower panel are angels bearing the instruments of the passion, namely, the reed, the nails, the spear, the pillar of scourging, and the scourge, the crown of thorns, and the ladder. The work has all the pomp and dignity of Byzantine conventionalism, and for richness of color, and splendor of arrangement is one of the most impressive of this magnificent series. It is deeply devotional in tone and must be looked upon as among the finest Christian paintings of the period.

SARGENT, PAUL DUDLEY: soldier: 1745–1828, Sep. 28; b. Salem, Mass.; son of Col. Epes S., who was long prominent in colonial affairs. He was in command of a patriot regt. at the siege of Boston by the British; received a wound in the battle of Bunker Hill; became brig.gen. 1776; and was in the battles at Harlem, White Plains, Trenton, and Princeton. After the war he was for a long period chief-justice of the Hancock (Me.) co. court of common pleas, and held other offices. He was the first representative of his district in the legislature. He died at Sullivan, Me.

SAR'GENT, WINTHROP: soldier: 1753, May 1—1820, June 3; b. Gloucester, Mass. He graduated from Harvard College; served in the revolutionary war, was in many battles, and reached the rank of major; was secretary of the Ohio Company 1787, and was afterward its governor; was govt. surveyor of the Northwest Territory; was in the Indian wars, and was appointed adjt.gen. He was a member of learned bodies, and published *Boston*, a poetical work, and, with B. B. Smith, *Papers Relative to Certain American Antiquities*. He died at New Orleans

SARI, *sä'rē:* city, cap. of the province of Mazandaran, Persia; in the midst of gardens, on the banks of a small stream, the Tejend, 18 m. s. of the Caspian Sea. It is a modern town, built near the ruins of a very ancient one; and has some trade with Russia and with interior Persia. Pop. about 8,000.

SARIGUE, n. *sä-rēg'* [F. *sarigue;* Brazilian, *çarigueya*] a species of opossum found in Cayenne.

SARK, n. *sârk* [AS. *syrce;* Scot. *sark;* Icel. *serkr*, a shirt]: a kind of tunic; a shirt. SARKED, a. *sârk't*, covered with thin deals. SARKING, n. *sârk'ĭng*, and SARKIN, n. *sârk'ĭn*, thin boards for lining, to be placed under slates, and for similar purposes.

SARK, *sârk:* one of the Channel Islands: see JERSEY.

SARLAC, n. *sâr'lăk*, or SAR'LYK, n. *-lĭk* [Mongolian, *sarlyk*]: the grunting ox of Tartary—called also the *yak*.

SARMATIAN, a. *sâr-mā'shĭ-ăn*, or SARMAT'IC, a. *-măt'ĭk*, pert. to Sarmatia [*-mā'shĭ-ä*] and its inhabitants. SARMA'TIANS, n. ancestors of the Poles and Russians, extending from the Vistula to the Don. [The root *s-rm* in this word is prob. the same as *s-rb*, so that it has been conjectured that Sarmatians has the same ethnological meaning as *Serbi* and *Servi*. The oldest Greek form of the word (the only one found in Herodotus) is *Sauromatæ*.] The region occupied by the S. embraced (according to Ptolemy, our chief authority) a portion both of Europe and Asia.—1. The *European S.* are found as far w. as the Vistula; as far n. as the Venedicus Sinus (Gulf of Riga?), or even further; as far e. as the Crimea and the Don; and as far s. as Dacia. Roughly speaking, their territory corresponded to modern Esthonia, Lithuania, w. Russia, and parts of Poland and Galicia. The principal, at least the best-known nations among the European S. were the Peucini and Bastarnæ, about the mouths of the Danube, and in

Moldavia and Bessarabia; the Jazyges and Roxolani, probably in Kherson, Tauris, and Ekaterinoslav; the Venedi and Gythones, about Riga, Memel, and Elbing; and the Avareni, at the sources of the Vistula.—2. The *Asiatic S.* are found as far w. as the Tanais (Don), as far e. as the Caspian, as far s. as the Euxine and Caucasus, and as far n. as the watershed between the rivers that fall into the White Sea and the Black; but we have no distinct knowledge of their territorial possessions. N. of the Don, in the region now occupied by the Don Cossacks, dwelt the *Perierbidi;* s.e. of it, about Astrakhan, the Jaxamatæ. Beyond the Perierbidi lay the Asæi, the 'horse-eating' (*Hippophagi*) Sarmatæ, the 'Royal' and Hyperborean Sarmatæ, and many others, besides a multitude of nations in the region of the n. Caucasus. The question arises: What were these Sarmatians? The vast territory over which they spread, and the manifest inclusion under the name S. of different races, e.g., Goths, Finns, Lithuanians, Circassians, Scythians, and Slaves, prove that the term was loosely used by Ptolemy and his contemporaries, like the older Herodotean term Scythians, and is not strictly ethnological; yet Dr. Latham's view (see Smith's *Dictionary of Greek and Roman Geography*, arts. Sarmatia and Scythia), that it designated on the whole Slavic races, and in particular the n.e. portion of the great Slavic family, may be regarded as nearly certain. They are conjectured to have been of Median origin. Herodotus and Hippocrates represent them as a nomadic people, whose women were hunters and soldiers with and like the men. Ancient legends reconciled their descent from the Amazons by Scythian fathers.—The S. figure prominently among barbarians who vexed the n.e. frontiers of the Roman Empire.

SARMENT, n. *sär'mĕnt*, or SARMENTUM, n. *sär-mĕn'tŭm* [L. *sarmentum*, a twig—from *sarpo*, I trim; F. *sarment*, a vine-shoot]: in *bot.*, a slender twining stem which supports itself by means of others; a running stem which gives off leaves and roots at intervals, as the strawberry. SAR'MENTO'SÆ, n. pl. *-tō'sē*, applied to plants which have climbing stems and branches, as the vine. SARMENTOUS, a. *sär-mĕn'tŭs*, applied to a running naked stem having only leaves in bunches at the joints or knots where it strikes the ground—also SARMEN'TOSE.

SARMIENTO, *sär-mē-ĕn'tō*, DOMINGO FAUSTINO: statesman: 1811, Feb. 13—1888, Nov. 2; b. San Juan, Argentine Republic. When eighteen years of age he participated in an unsuccessful revolution; fled to Chili, where he served in a store and taught school; opened a female school in San Juan 1836, but 1840 returned to Chili and engaged in educational work and afterward in journalism. He opened the first normal school in S. America, and founded the first daily newspaper in Santiago. He was employed by the Chilian govt. 1845-47 to study the school systems of Europe and the United States; settled at Buenos Ayres, 1855; was prominent in educational work; founded a college 1857; was senator, minister of the in-

terior, gov. of San Juan, minister to Chili and Peru and to the United States, and was pres. of the Argentine Republic 1868–74. Under his administration the prosperity of the country was greatly increased. He published educational works; a *Manual of the History of Ancient Peoples;* a *Life of Abraham Lincoln;* and other works. He died at Asuncion.

SARNIA, *sâr'nĭ-a,* or PORT SAR'NIA: city and port of entry, cap. of Lambton co., Ontario, Canada; at the mouth of the St. Clair river, and on the Grand Trunk and the Erie and Huron railroads; 61 m. w. from London. There are three weekly newspapers, two banks, a custom-house, large lumber-mills; and manufactures of woolen, leather, wood, and iron. Point Edward, formerly known as Port Sarnia is now included in the city limits. There is a tunnel to Port Huron, Mich. Steamers on their way to the upper lakes make the last stop at Sarnia. Pop. (1901) 8,176.

SARPLAR, n. *sâr'plâr* [F. *serpillière;* Sp. *arpillera,* sackcloth, packcloth]: a sack of wool containing 80 tods of 28 lb. each. SAR'PLIER, n. *-plēr,* coarse cloth of hemp, etc., used for packing goods.

SARNO, *sâr'nō:* city of s. Italy, province of Salerno, on the river Sarno, 13 m. n.w. of Salerno. It is a well-built town, with a very handsome cathedral, containing some good paintings; and has a seminary for priests, a hospital, several paper-manufactories, and foundries. Its environs are noted as producing very fine silk. In the centre of the town are springs of sulphureous and chalybeate waters. Among buildings worthy of notice is the ancient castle of the Barberini family.—Pop. about 11,445.

In the plain near S., Teias, King of the Goths, in a desperate battle with the Greeks commanded by Narses, 553, was vanquished and slain, and the reign of the Goths in Italy brought to a close.

SARPI, *sâr'pē,* PIETRO, better known by his monastic appellation, FRA PAOLO (Brother Paul): 1552, Aug. 14—1623, Jan. 15; b. Venice. He became an early proficient in mathematics and general literature; but resolved to embrace the monastic life, and in his 20th year took the vows in the Augustinian order of the Servi di Maria (see SERVITES). Soon afterward he was appointed by the Duke of Mantua prof. of theol. in that city; but he soon returned to his order, of which he was elected provincial in his 27th year. He continued his studies in languages, mathematics, astronomy and other branches of nat. philosophy, including the medical and physiological sciences, in which he attained proficiency, being by some writers regarded (on insufficient grounds) as sharing in the discovery of the circulation of the blood. The freedom of some of his opinions led to his being charged at Rome with heterodox views; and though held free from actual heresy, his tendencies became an object of suspicion. In the dispute between the republic of Venice and Paul V. (q.v.) on the subject of clerical immunities

and of the papal prerogative of interference with national government, S. threw himself energetically into the anti-papal party. It has been said of his activity in this controversy that 'it registers the progress of mankind, and forms an epoch in the history of free discussion.' S.'s appeal was to reason and to history. Being summoned to Rome to account for his conduct, he refused to obey, and was accordingly excommunicated as contumacious. The zeal of S.'s opposition to Rome drew on him the hostility of the partizans of the Roman claim; and an attempt was even made upon his life by a band of assassins, who found refuge in the papal territories. S. confined himself thenceforward within the inclosure of his monastery. In this retirement he composed his celebrated *History of the Council of Trent*, long the subject of controversy and criticism. It was published in London by Antonio de Dominis, ex-bishop of Spalatro, who had recently conformed to Protestantism, at first under the pseudonym *Pietro Soave Polano*, an anagram of the real name of the author, *Paolo Sarpi Veneto;* and it had great popularity with the adversaries of Rome in England and throughout the continent. It is not a simple history of the proceedings of the Council, but rather a controversial narrative of the discussions, in which the writer freely enters into the merits of the doctrines under discussion, and in many cases evinces a strong anti-Rom.-Cath. bias. His judgment of the motives and of the conduct of the members of the Council, especially of the representatives of the pope and his partizans in the assembly, is uniformly hostile, and has been accepted by Protestants as a strong testimony against Rome from a member of the Roman Church. But whatever judgment we may form of S.'s credibility on his own merits, it is idle to regard him as a member of the Church of Rome. Ranke, in his critical examination of S.'s work, and of the voluminous counter-history of the Council of Trent by the Jesuit (afterward Cardinal) Pallavicino, declares that his unsupported statements cannot be accepted with entire security when the question concerns a damaging narrative of some intrigue of the legates in the Council, or of some cabal of the Italian bishops in the interest of Rome. Ranke finds both these books the works not of historians but of advocates; neither of them aims to falsify, but in each a strong bias has unconsciously given untruthful color and shading. The literary qualities of S.'s work, Ranke rates very highly. The French translation is by the celebrated Courrayer, and is enriched with copious vindicatory and critical annotations. His life was without reproach; his disposition was placid and unselfish; and his long-tried zeal as the champion of the republic made him the favorite of his fellow-citizens. His *History of the Council of Trent* has been reprinted in numberless editions in most of the languages of Europe; and his collected works were pub. Verona. 8 vols. 4to, 1761–68; and Naples 24 vols. 8 vo., 1796.

SARRACENIA, *sär-râ-sē'nĭ-a*, or SIDE-SADDLE FLOWER: genus of singular marsh plants, natives of N. America. *S. purpurea* is common from Hudson's Bay to Carolina: the other species are confined to the southern states; and include the Red-flowered Trumpet-leaf (*S. rubra*), with leaves 1 ft. long; the Great Trumpet-leaf (*S. Drummondii*), of Fla., leaves 2–3 ft. long; the Parrot Pitcher-plant (*S. psittacina*), with short, spreading leaves, having an inflated, spotted hood; the Spotted Trumpet-leaf (*S. variolaris*), and the Yellow Trumpet-leaf (*S. flava*), the leaves with colored veins, and 2 ft. long; the last two species having yellow flowers, the others purple. They are herbaceous perennial plants, with radical leaves and scapes, which bear one or more large flowers. The leaves are of very

Sarracenia purpurea:

1, a flower, from which the corolla has fallen off, showing the very large 5-angled stigma; *a*, a fully expanded flower; *b*, germen; *c*, section of the fruit.

remarkable structure, the stalk being hollow and urn-shaped, and the blade of the leaf articulated at its apex, and fitting like a lid. It is from the form of the leaves that the name Side-saddle Flower is derived.—The genus is the type of the small nat. order *Sarraceniaceæ*, the only other genus of which has been discovered in Guiana. The order is closely allied to *Papaveraceæ*.

SARREGUEMINES, *sâr gĕh-mēn'* (Ger. SAARGEMÜND, *sâr'gĕh-münt*): formerly a frontier town in n. France, but since the war of 1870–1 a German possession; in the province of Alsace-Lorraine, 41 m. e. of Metz. It is famous for its pottery; hempen fabrics and velvets also are made. Pop. 13,100.

SARSAPARILLA, n. *sär'sä-pä-ril'lä* [Sp. *zarzaparilla* —from Sp. *zarza*, a bramble, and *parilla*, a small vine: It. *salsapariglia*]: substance popular in medicine, product of several species of *Smilax* (q.v.), though the species yielding the different kinds brought to the market have not yet been fully ascertained. In the United States the name S. is applied to plants very far removed botanically from the Smilax, namely to certain species of *Aralia*, of the Ginseng family—the Common Wild S. (*A. nudicaulis*) and the Bristly S. (*A. hispida*), the former used as a substitute for the officinal S. Among the species of *Smilax* furnishing the true S. of commerce, the three principal are believed to be *S. officinalis*, *S. medica*, and *S. papyracea;* twining shrubs with prickly angular stems; the first with large ovate-oblong, acute, heart-shaped, leathery leaves; the second with shortly acuminate smooth leaves, the lower ones heart-shaped, the upper ones approaching to ovate; the third with membranous, oval-oblong, obtuse

Sarsaparilla.

leaves. These shrubs are natives of warm parts of America; *S officinalis* and *S. papyracea* being found in S America, and *S. medica* on the Mexican Andes. Some botanists regard them as mere varieties of one species.

The part of the plant used in medicine is the dried root, of which the following characters are given in the Brit. Pharmacopœia: 'Roots not thicker than a goose quill, generally many ft. in length, reddish-brown, covered with rootlets, and folded in bundles about 18 inches long, scentless; taste mucilaginous, feebly bitterish, faintly acrid.' S. has been analyzed by various chemists, and appears to consist of volatile oil, most of which is expelled during the process of drying, of a white crystallizable neutral substance named *Smilacin*, whose composition is represented by the formula $C_{16}H_{13}O_5$, an acrid bitter resin, lignin, starch, and mucilage. S. is one of the alterative and dia-

phoretic medicines; and is very valuable in the opinion of many, but of little worth according to others. The cases in which it is deemed serviceable are chronic rheumatism, secondary syphilitic affections, chronic skin-diseases, etc. To be of any service, S. must be taken in considerable doses. The compound decoction, formerly known as the *Decoction of Sweet Woods*, is the best preparation, in doses of four or six ounces three times a day. It is often used as a vehicle for more active medicines.

The root of *S. aspera*, native of s. Europe, is used as a substitute for S., though inferior, and is called Italian S.

The root of *Hemidesmus Indicus*, climbing shrub of nat. order *Asclepiaceæ*, is used in India as a substitute for S., and is called Indian S.: the plant is common in all parts of India: the root has a peculiar and pleasant aromatic odor and bitter taste.

In Germany, the roots of *Carex arenaria, C. disticha*, and *C. hirta* (see CAREX) are occasionally used as a substitute for S., under the name German sarsaparilla.

SARSE, n. *sârs* [F. *sas;* OF. *saas*, a sieve—from low L. *setaceum*, something made of bristles—from L. *seta*, a bristle: Sp. *sedaza*]: a fine sieve.

SARSEN-STONES, *sâr'sĕn-stōnz:* in the *s. of England*, a name given to those large tabular blocks of sandstone which are scattered over the surface of the Chalk downs—known also as *Druid stones* and *grey wethers*, but which had no connection with the Druids.

SARSFIELD, *sârs'fēld*, PATRICK, Earl of Lucan: soldier: 1645–93; b. Lucan, Dublin co., Ireland. His first milit. service was as ensign in the regt. of Monmouth, in the army of the king of France; then he was lieut. in the guards of the king of England: at the revolution he followed James II. into France, and 1689 accompanied him to Ireland. James made him member of his privy council, col. of horse, and brigadier; then maj.gen., Earl of Lucan, etc. At the siege of Limerick he distinguished himself by planning and executing a night sally from the town and a raid around the enemy, destroying a convoy of artillery and munitions. He was in all the battles till the treaty of Limerick, 1691, Oct. Then he passed into France, was commissioned maj.gen., and served with great distinction against the English and their Dutch allies in the Low Countries. He received a mortal wound in the battle of Neerwinden.

SARTAIN, *sâr'tān*, JOHN: artist: b. London, 1808, Oct. 24. He learned line and mezzotint engraving and studied painting, came to the United States 1830, became famous as engraver and etcher, was connected with various periodicals, which he illustrated, has made a great number of plates for book-illustration and for framing, and has designed some fine monuments. He is a member of various societies and has received decorations from foreign governments. For many years he resided in Philadelphia. He d. at Philadelphia, 1897, Oct.

SAR'TAIN, WILLIAM: artist: b. Philadelphia, 1843, Nov, 21; son of John S. He was taught engraving by his father, and afterward studied at the Pennsylvania Acad. and in Paris. He remained abroad eight years, settled in New York 1877, and became a successful teacher as well as engraver and painter. He was one of the founders of the Soc. of Amer. Artists, and is connected with other associations. He has painted many Italian scenes and numerous figures, which have had much popular favor.

SARTHE, *sârt:* inland dept. of France, n. of the Loire; 2,390 sq. m. It is a country of plains, traversed by low hills and by undulations clothed with vines, of large picturesque forests, and of pleasant valleys. The soil is fertile, productive in grain and in clover; hemp is cultivated, and hempen fabrics are largely manufactured. The wine produced is of mediocre quality. The climate is healthful and temperate. Swine and cattle are reared in large numbers for the Paris and other markets.—S. is divided into the four departments Mans, La Flèche, Mamers, and St. Calais: the cap. is Le Mans (see MANS, LE). —Pop. of dept. (1891) 429,737; (1901) 422,699.

SARTI, *sâr'tē*, GIUSEPPE: musical composer: 1729, Dec. 1—1802, July 28; b. Faenza in the Papal States. He studied under Padre Martini at Bologna; and 1752 produced his first opera, *Il Re Pastore*, performed at Faenza with great success. He held for a time the office of *Hof Kapellmeister* at Copenhagen, but returned to Italy 1765. In 1770 and following years, he composed his principal operas, including *Le gelosie villane* and *Giulio Sabino*, the latter enthusiastically received throughout Italy. In 1779 he became *maestro di capella* of the Duomo at Milan, and gave himself to composition of church music. In 1784 he went to St. Petersburg as music director of the court of Empress Catharine, by whom he was treated with great liberality, and raised to the highest rank of nobility. He died at Berlin, on his return to Italy. His operas are 30 in number; but the composition by which he is now most known is his beautiful sacred terzett, *Amplius Lava Me*. S. was musical instructor of Cherubini (q.v.).

SARTO, *sâr'to*, ANDREA DEL: one of the most famous painters of the Florentine school: 1487 (perhaps 1486)—1531, Jan. 22; b. Florence. According to most writers, the family name was Vannucchi, and Andrea only received the name *del Sarto* (the Tailor) from the occupation of his father: some modern writers question this. S. was pupil of Piero di Cosimo, but formed his style mainly through study of the works of Masaccio, Domenico Ghirlandajo, and Buonarotti. These artists inspired him with a love of fresco-painting, in which he achieved great distinction. 1509-14 he executed a series of representations from the life of St. Filippo Benizzi, in the porch of the Annunziata at Florence; and in these the characteristics of his genius—dignity of composition, purity of form, freshness of color, and grace of expression—are seen at their

MADONNA DELLE ARPIE, BY ANDREA DEL SARTO.

best. In 1514 he commenced a series of frescoes from the life of John the Baptist, finished 12 years afterward. The finest works, of what may be called his middle period, are the *Madonna di San Francesco* and the *Contending Theologians*, both in the Florentine galleries. In 1518, Francis I. invited Sarto to Paris, where he painted, among other things, the picture of *Charity* in the Louvre; but at the solicitations of his wife, he returned to Florence, but with the promise exacted by the king that his absence should be short, and that he would bring with him works of art for his royal patron; for which purpose the king put funds in his hand. Sarto, an easy-going and not very ambitious man, allowed himself to use the king's money in building himself a house in Florence; and though afterward he sought to regain the favor of Francis, his efforts were in vain. His marriage, 1512, to a very handsome widow, Lucrezia del Fede, whose face he constantly presents in his pictures, seems to have been little to his advantage. To his later years belong his *Piety*, his most celebrated fresco, the *Madonna del Sacco* (in the Annunziata at Florence), the *Madonna with Saints* (in the Berlin Museum), and the *Sacrifice of Abraham* (in the Dresden Gallery). His largest fresco is the *Lord's Supper*, in the old Abbey of San Salvi, near Florence.

SARTO, GIUSEPPE. See PIUS X.

SARTORIUS, n. *sâr-tō'rĭ-ŭs* [L. *sartor*, a tailor—from *sarcĭō*, I mend]: in *anat.*, the muscle of the thigh which enables the legs to be thrown across each other, or to be bent inward obliquely.

SARUM, *sā'rŭm*, OLD: extinct city and borough of England, on a hill 2 m. n. of Salisbury, Wiltshire. It dated from the time of the Romans, by whom it was known as *Sorbiodunum*, and remained an important town under the Saxons. A Witenagemôte was held at Old Sarum 960; and here William the Conqueror assembled all the barons of his kingdom 1086. It was the seat of a bishop from the reign of William the Conqueror till 1220, when the cathedral was removed to New Sarum, now Salisbury (q.v.), and was followed by most of the inhabitants. In Henry VII.'s time it was almost wholly deserted, and has so continued till the present time. Some traces of walls and ramparts, and of its cathedral and castle, are still seen. Though without a single house or inhabitant, two members represented it in parliament, till, like many other rotten boroughs, it was disfranchised by the Reform Bill 1832.

SA'RUM, USE OF: one of the modifications of the Roman liturgy in use in England before the Reformation. The 'Sarum Use' was edited by Osmund, Bp. of Salisbury, 1087 (see SARUM, OLD): other 'uses' co-existed with it, as the use of York, of Hereford, of Exeter, etc., but the Sarum Use, as in Salisbury Cathedral, had at the

beginning of the 16th century come into general acceptance in s. England and in the English Pale in Ireland. See Maskell's *Ancient Liturgy of the Church of England,* and the same author's *Monumenta Ritualia.*

SARVÂSTIVÂDAS, or SARVÂSTIVÂDINS [Skr., those who maintain the reality of all existence]: one of the four divisions of the *Vaibhâshika* system of Buddhism: its reputed founder was *Râhula,* son of *the* Buddha S'âkyamuni.—See C. F. Koeppen, *Die Religion des Buddha* (Berlin 1857).

SARZA, n. *sâr'ză* [Sp. *zarza,* a bramble]: another name for SARSAPARILLA, which see.

SASH, n. *săsh* [O.It. *sessa,* a Persian turban: Pers. *shast,* a girdle worn by the Magi]: a loose belt, generally of silk, worn for ornament round the waist or over the shoulders. By some military officers a sash is worn over one shoulder as badge of distinction: V. to dress with a sash.

SASH, n. *săsh* [F. *châssis,* the sliding-frame of a window; *châsse,* a kind of frame, a shrine—from L. *capsa,* a case or box]: framework in which the panes of a window are set, which is made to move up and down, generally on pulleys, or is hung as a door: V. to supply with sash-windows. SASH'ING, imp. SASHED, pp. *săsht.* SASH-FRAME, the frame in which sashes are fitted. SASH-WINDOW, a window fitted with sashes. SASH-LINE, the line by which a sash is suspended in a frame.

SASHOON, n. *săsh'ôn* [etym. doubtful]: a soft leather pad placed inside a shoe to ease the pressure on a tender spot.

SA'SIN. See ANTELOPE.

SASINE, n. *sā'zĭn* [F. *saisine,* possession of land—from *saisir,* to take possession—from mid. L. *sacīrĕ,* to seize (see SEIZE)]: in *Scotch law,* the act of giving legal possession of feudal property, or the written document by which that fact is proved; elsewhere the term is obsolete. See SEIZIN: INFEFFMENT.

SASKATCHEWAN, *săs-kăch'ė-wawn:* a province of the Dominion of Canada, formed out of the Northwest Territories, on Sep. 1, 1905, and comprising the greater part of the former provisional districts of Assiniboia and Saskatchewan with the easterly half of the provisional district of Athabasca. Area about 270,000 sq.m.; pop. (1909) estimated at 350,000; capital Regina. It is bounded on the n. by the Mackenzie district, on the w. by the province of Alberta, on the s. by the state of Montana and North Dakota, on the e. by the province of Manitoba and Keewatin district. The province is similar to Alberta in its topographical features, the southerly portion being adapted to agricultural and pastoral pursuits, chiefly the cultivation of cereals with ranching and dairying, and the northerly portion being densely wooded. The wheat industry is assuming enormous proportions,

BRITISH COLUMBIA
ALBERTA AND
SASKATCHEWAN.
SCALE OF STATUTE MILES.
0 50 100 150 200 250
Copyright, 1905, by Rand, McNally & Co.
RAND, McNALLY & CO., ENGR'S, CHI.
Longitude West from Greenwich
KLONDIKE REGION
YUKON
NORTH WEST TERRITORIES
BRITISH
COLUMBIA
ALBERTA
SASKATCHEWAN
UNITED STATES
ALASKA
VANCOUVER ISLAND
QUEEN CHARLOTTE ISLANDS
GREAT BEAR LAKE
GREAT SLAVE LAKE
ATHABASKA LAKE
LAKE WINNIPEGOSIS
Fort Enterprise
Fort Resolution
Fort Providence
Fort Simpson
Fort Liard
Fort Smith
Fort Chipewyan
Fort Vermillion
Fort du Tremble
McLeods Fort
Fort St. John
Dunvegan
H. S. Post
Fort McMurray
Fort Connelly
Hazelton
Port Simpson
Port Essington
Port Babine
Fort St. James
Fort Fraser
Fort George
Quesnel
Barkerville
Alexandria
Quesnel L.
Kamloops
Clinton
Lillooet
Ashcroft
Lytton
Vernon
Nakusp
Nelson
Revelstoke
Golden
Banff
Calgary
Edmonton
Lethbridge
Medicine Hat
Battleford
Saskatoon
Prince Albert
Regina
Moose Jaw
Yorkton
Brandon
Winnipeg
Vancouver
Victoria
Nanaimo
Juneau
Dawson
Fort Selkirk
Klondike R.
Ogilvie
Stewart
McMillan
Pelly R.
Pelly Lakes
Lewes R.
Teslin
Atlin
Skaguay
Dyea
Dry B.
Lituya B.
ALEXANDER ARCHIPELAGO
CHICAGOF I.
Salisbury Sd.
Sitkao
BARANOF I.
KUPREANOF I.
Wrangell
Christian Sd.
PR. OF WALES I.
DALL I.
Dixon Entrance
C. Knox
Rose Pt.
QUEEN CHARLOTTE
GRAHAM I.
BANKS I.
PRINCESS ROYAL I.
PRICE I.
ISLANDS
MORESBY I.
PREVOST I.
C. St. James
HUNTER I.
CALVERT I.
Queen Charlotte Sd.
C. Scott
Quatsino Sd.
VANCOUVER
VICTORIA
NOOTKA I.
ISLAND
Barclay Sd.
Juan de Fuca St.
C. Flattery
Telegraph Cr.
Glenora
SHEEP MT.
Findlay R.
Peace
Nelson R.
Black R.
Liard
Hay R.
Sandy R.
Great Slave L.
Yellow Knife R.
Mackenzie R.
Nahanni R.
Rum L.
Point L.
Aylmer Lake
Clinton Golden L.
Doobaunt Lake
Kazan
Lathkyeda L.
Artillery Lake
Fort Reliance
Wainwright L.
Mc Leods
Christie B.
Angikuni
Telzon
Kasba L.
Island L.
Baralzon L.
Fish R.
Magnet R.
Reboed L.
Boche
Ft. Fond du Lac
Black L.
Ice R.
Wollaston or Hatchet L.
Cree L.
Du Brochet
Reindeer or S. Indian or Big L.
Cariboo
Granville L.
Nelson R.
Churchill
Duck L.
Burntwood L.
Methy L.
Buffalo L.
Black Bear Lake
Cross L.
L. la Plonge
L. la Ronge
Reed L.
Moose
Beaver L.
Pine Island L.
Montreal L.
Red Deer L.
Prince Albert
Kirkpatrick
Fort Pitt
Battleford
Duck L.
Batoch
Hague
Humboldt
C. H. B. Post
Saskatoon
Quill Lakes
Hanley
Strassburg
Davidson
Aylesbury
Disley
Craven
Balgonie
Qu'Appelle
Wood Mtn. Post
White Mud
Milk River
Ft. Assiniboine
Buford
Glasgow
Shelby
Sweetgrass
Coutts
Kootenay
Elko
Wardner
Cranbrook
Fernie
Pincher
Macleod
Calgary
Banff
Canmore
Laggan
Field
Golden
Revelstoke
Nelson
Kaslo
Slocan City
New Denver
Sicamous
Armstrong
Vernon
Nakusp
Salmon Arm
Kamloops
Savona
Ashcroft
Spences Br.
Lytton
Lillooet
Clinton
Chilco L.
Quesnel L.
Alexandria
Barkerville
Quesnel
Port Essington
Port Simpson
Port Babine
Port Fraser
Port George
Port St. James
Port Fraser
Port Essington
Port Simpson
Port Babine
Port St. James
Port Fraser
Port George

the soil and climate being particularly favorable for its growth. The valley of the Saskatchewan river, the chief water course, is fitted to sustain as dense an agricultural population as any area of equal extent in the world. Manufacturing is not carried on to any extent as yet, the principal industries being connected with agricultural and lumbering operations. There are valuable deposits of coal, iron, salt, etc.

The government of the province is vested in a lieutenant governor, appointed by the Dominion government for five years, with an executive council of four members. The premier (who is president of the executive council) is also commissioner of public works and commissioner of railways; the other three members of the executive council holding ministerial appointments respectively as attorney-general; provincial secretary, who is also commissioner of agriculture; provincial treasurer, who is also commissioner of education. The province is represented in the Dominion Parliament by four senators and ten members of the House of Commons. The legislative assembly is composed of twenty-five members, elected for four years. The supreme court comprises the chief justice with four puisne judges, who all reside at the seat of government. The province is divided into eight judicial districts, each presided over by a resident judge, who is also *ex-officio* a judge of the surrogate court.

SASKATCHEWAN: a Canadian river which has its sources in the Rocky mountains, drawing its waters from the Rocky mountains, and formed by two head-streams—the South Branch or Bow river (which is considered the main upper Saskatchewan, and the North Branch. The South Branch issues from a lake about 4 m. long, fed by a glacier descending from a magnificent *mer de glace*, and by a group of springs. A few yards n. of this group of springs is another group, from which the North Branch takes its rise; height above sea-level 6,347 ft.; lat. 51° 40′ n.; long. 117° 30′ w. The South Branch flows s.e. to its junction with the Belly river, long. 111° 40′ w., then n.e. to its junction with the North Branch, long. 105° w. Fed mainly from the same glacier that feeds the South Branch, the North Branch flows n. past Mt. Murchison (15,789 ft. above sea-level, and one of the highest peaks of the Rocky mountains), n. through Kutanic Plain, a fine prairie abounding in game, and then in a general easterly direction to its confluence with the South Branch. These two main branches are navigable—the North Branch about two-thirds of its length. From long. 105° w., the Saskatchewan flows e. into Lake Winnipeg. Length of main river, from the union of the North and South Branches, 200 m. to Lake Winnipeg: of North Branch, variously stated 550 to 830 m. of South Branch (very devious) about 900 m., according to some estimates. From this lake it flows n.e. under the name usually of Nelson river or Katchewan, and

enters Hudson's Bay. It flows through a region yielding coal, salt, iron, gold, etc., and now attracting numerous settlers. From the South Branch of this great river n.w. to Peace river the climate is adapted to the growth of wheat, and the valley of the river is said to be fitted to sustain as dense an agricultural population as any area of equal extent in the world. The main stream and its branches afford about 1,000 m. of navigable waterway, and steamers now ply on it.

SASSABY, n. *săs'a-bĭ* [native name]: *Damalis lunatus,* the bastard hartebeest of the Cape Colonists. It stands 4½ ft. high, with strong crescentic horns, a foot in length, points directed inward. They are dark purple-brown above, changing to dusky yellow beneath. They live in herds from six to ten in flat or wooded districts, and their flesh makes excellent venison. Unlike many antelopes, which are almost independent of water, the sassaby needs to drink daily, so its presence is always a sign that water is near.

SAS'SACUS: Pequot Indian chief: b. near Groton, Conn., about 1560; d. Mohawk Settlement, N. Y., 1637. He was a powerful chief, a great warrior, and was believed by his own and other tribes to possess supernatural powers. The Pequot tribe occupied a large tract of land in s.e. Connecticut and consisted of about 700 warriors who were the terror of the settlers along the New England coast. In 1637 he attacked the English fort at Saybrook, Conn., massacred its inhabitants, and then attacked Wethersfield, where he murdered several women and made captives of others. The colonists mustered their forces under the leadership of John Mason and destroyed the Pequot settlement, 1637, June 5. Sassacus took refuge with the Mohawks, who soon afterward murdered him.

SASSAFRAS, n. *săs'să-frăs* [F. *sassafras;* Port. *sassafraz;* It. *sassafrasso,* sassafras—from L. *saxum,* a stone; *frango,* I break—so named as supposed to break the stone in the bladder]: root, wood, and flowers of an American tree.—The sassafras (*Sassafras*) is a genus of trees or shrubs of nat. order *Lauraceæ,* having diœcious flowers with nine stamens. The sassafras-tree (*S. officinale*) of North America, from Canada to Florida, a mere bush in the n., but a tree 50 ft. high in the s., has deciduous leaves, yellow flowers, which appear before the leaves, and small dark-blue fruit. The wood is soft, light, coarse in fibre, dirty-white and reddish-brown, with a strong but agreeable smell, resembling fennel, and an aromatic, rather pungent and sweetish taste. The wood of the root possesses these properties in higher degree than the stem, and the thick spongy bark of the root most of all. The wood is brought to market in the form of chips, but the bark of the root is preferred for medicinal use; it is a powerful stimulant, sudorific, and diuretic, and is employed in cutaneous diseases, gout, rheumatism, and syphilis. generally in combination with other medicines. It

contains a volatile oil, *Oil of S.*, often used instead. An agreeable beverage is made by infusion of S. bark or S. wood; and a similar drink was formerly sold in the streets of London under the name *Saloop*. The leaves of S. contain so much mucilage that they are used for thickening soup.—Another species of S. (*S. parthenoxylon*), with similar properties, is found in Sumatra.

SAS'SAFRAS NUTS: see PITCHURIM BEANS.

SASSANAGE, n. *săs'an-ĭj* [F. *sasser*, to sift]: stones left after sifting.

SASSANIDÆ, *săs-săn'ē-dē*, or SASSAN'IANS (also SASAN'IDÆ—SASAN'IANS): dynasty which succeeded that of the Arsacidæ on the throne of Persia (q.v.); named from Sassan, grandfather of the newly-elected monarch ARDISHIR (reigned 218–240). The reign of the S. is remarkable in the history of Persia, not for the extent of their sway, nor the magnificence of their court, though in these they could vie with the Achæmenidæ at the epoch of their greatest splendor, but for the intense energy which they infused into the people at large. A comparatively small army of Greeks could successfully strive against the immense hordes of Xerxes and Darius; but the veterans of Rome could gain few laurels in conflict with an equal Persian force under the S.—Ardishir made the desert of Khiva and the Tigris his boundaries, and resigned the throne to his son, SHAHPUR I. (SAPOR) (reigned 240–273), who subdued Armenia, took Algezira (258) and Nisibis, and totally routed the Romans at Edessa, taking prisoner Emperor Valerian and the relics of his army, and overrunning Syria, Cappadocia, and other portions of w. Asia. This monarch sought the prosperity of his subjects and the encouragement of the fine arts as well as the extension of his power; but his enlightened plans were not carried out by his immediate successors.—NARSI (NARSES) (reigned 294–303) retook Armenia, and signally defeated the Romans under Galerius; but fortune deserted him in the following year (297).—His grandson, SHAHPUR II. (reigned 310–381), surnamed POSTHUMUS, an infant, succeeded, and Persia, during his minority, was much harassed by the Arabs, Romans, and Tartars; but Shahpur had no sooner taken the reins of govt, than in return he ravaged Yemen, punished the Tartars, and took the sole revenge in his power against the Romans, by a dreadful persecution of the Christians in his dominions. A regular war speedily followed; the army of Constantius was routed at Singarah and he was compelled to sue for peace. But the war continued; Constantius's successor, Julian, was defeated, and lost his life (363) near Ctesiphon; and the Romans concluded the humiliating peace of Dura. Armenia, Iberia, and the other Caucasian principalities were then reduced by Shahpur.—Among his successors were BAHARAM V. (reigned 420–448), surnamed GOUR, who recommenced hostilities with the Romans, the result being a partition of Armenia and a truce for 100 years: and KOBAD (COBADES or CABADES) (reigned 488–498, 502–531), an able monarch, who, on the Romans refusing

to pay the stipulated tribute, declared war against them. and defeated them in every engagement, concluding peace (505) on receiving 11,000 lbs. of gold. A second war, which began 521, was in favor of the Persians throughout, though the Romans then had a staff of generals unsurpassed at any previous epoch. The war continued after the accession of KHOSRU I. (q.v.) (reigned 531–579), and at intervals till nearly the end of the century, when another great Persian conqueror, KHOSRU II. (q.v.) (reigned 591–628), ascended the throne: for details of his annihilation (for a time) of the Roman power in Asia, and the final resistless march of Heraclius, who again cooped up the Persians within the Tigris, and inflicted on the S. the blow from which they never recovered, see HERACLIUS.—After four years of petty civil war, which wore out the remaining strength of the nation, YESDIGERD III. (reigned 632–651) was raised to the throne. The Arabs, who had already twice attacked Persia without success, made a third attempt 639, and routed Yesdigerd's army at Kudseah (Cadesia) with immense loss. Yesdigerd made another energetic attempt to rescue his kingdom; but the great battle of Nahavend, in which more than 100,000 Persians are said to have been slain, extinguished all hope of success; and the unfortunate monarch became a fugitive in n. Khorassan till 651, when he was treacherously murdered.—Thus the dynasty which had pulled down the Romans from their proud pre-eminence among nations perished by the hands of a horde of robber-fanatics, under whose barbarous Mohammedan rule the extensive commercial prosperity and refined civilization which had been so carefully fostered for four centuries, were utterly swept away, leaving only such traces as ruined aqueducts, choked-up canals, and the still magnificent remains of almost forgotten cities.

SASSARI, *sâs'sâ-rē:* city in the n.w. of the island of Sardinia, chief town of the province of Sassari; 8 m. from the shore of the Gulf of Asinara. It is a handsome and important archiepiscopal city, and has a vast cathedral, with many sculptures, one by Canova; a univ. founded 1776; a college; and a rich library, with the MSS. of the Azuni. S. is a very busy and growing town, trading especially in grain, wine, fruits, wool, olive oil, and tobacco. Its harbor, Torres, is 10 m. n.w. of S.; it is narrow and shallow, admitting only small vessels. Pop. (1881) 31,596; (1885) 38,000; (1901) 38,268.

SASSENACH, n. *săs'sĕn-ăk* [Gael. *sasunnach*, an Englishman—a corruption of *Saxon*]: a name applied by the early Kelts and Britons, and subsequently by the Picts and Irish Scots, to the Saxon invaders of Britain; an Englishman. *Note.*—The *ch* in Scotch is guttural.

SASSOLINE, or SASSOLIN, n. *săs'sō-lĭn* [from *Sasso*, near Sienna, where first known at the hot springs: F. *sassolin*]: in *min.*, a term for *boracic acid*, which occurs in thin, scaly, irregular, six-sided crystals, of a whitish color, pearly lustre, and less or more translucent, found with various impurities in many volcanic regions.

SASTRA, n. *săs'tră*, or SHASTRA, n. *shăs'tră*, and SHASTER, n. *shăs'tĕr* [Hind. *shastr* or *shastra*—from *shas*, to govern]: among the *Hindus*, the sacred books containing the institutes of their religion; the six great *sastras*, containing, according to the Hindus, all knowledge human and divine, are the *Vedas*, the *Upavedas*, the *Vedanta*, the *Upanangas*, including the *Puranas* and the *Dharmashastra*.

SAT: pt. of SIT, which see.

SATALIAH, *sât-â'lē-â:* another name of Adalia (q.v.).

SATAN, n. *sā'tăn* [Heb. *satan*, an adversary or enemy: Gr. *satan*]: the Evil One; chief of the fallen angels; the Devil (q.v.). SATANIC, a. *sā-tăn'ĭk*, or SATAN'ICAL, a. *-i-kăl*, pertaining to or resembling Satan; infernal; devilish. SATAN'ICALLY, ad. *-lĭ*.

SATARA, *sâ-tâ'râ*, generally spelled *Sattarah*, *sât-tâ'râ*. collectorate in the s. division of the province of Bombay, Brit. India; bounded n. by the state of Poona, w. by the lofty ridge of the W. Ghauts; 5,371 sq.m. SATARA, the cap., from which the state derives its name, is one of the most salubrious and pleasant stations in the Deccan, 133 m. s.e. of Bombay (pop. 29,000). Pop. of collectorate (1881), 1,062,350.

SATCHEL, n. *săch'ĕl* [OF. *sachel*, a little bag—from L. *saccellus*, a small bag, a purse; *saccus*, a bag: Dut. *sackel*; Ger. *säckel*, a purse]: a bag in which to carry papers, books, etc.; a small travelling-bag; also spelt SACHEL.

SATE, v. *sāt* [a contracted form of *satiate:* L. *satiārĕ*, to satisfy—from *satis*, enough]: to satisfy the appetite: to glut; to surfeit; to feed beyond natural desire. SA'TING, imp. SA'TED, pp.

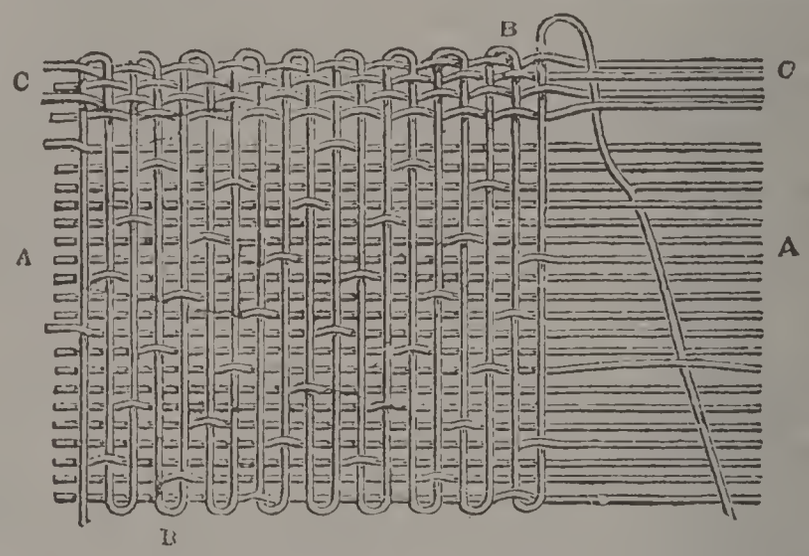
SATEEN, n. *săt-ēn':* a kind of glossy fabric, made in imitation of satin, but having a woolen or cotton material.

SATELLITE, n. *săt'ĕl-līt* [F. *satellite*, a satellite—from L. *satelles* or *satel'lĭtem*, an attendant]: that which attends or accompanies; a small planet which revolves round a large one; an obsequious attendant and hanger-on.

SAT'ELLITES, in Astronomy: celestial bodies which attend upon and revolve round some of the planets, as these latter revolve round the sun; hence scientific men frequently apply to them the generic term, 'secondary planets.' The Earth, Mars, Jupiter, Saturn, Uranus, and Neptune, each possesses one or more of these attendants. The eclipses, inequalities, inclinations, and reciprocal attractions of the S., have been carefully noted from time to time, and the theory of their motions, at least of the most prominent of them, has been found to coincide with that of the moon. The S. of Jupiter are invested with additional interest, from their eclipses having been the means of directing Römer to his great discovery of the successive propagation and velocity of light. On careful investigation, he found that the eclipses regularly happened 16′ 38″ earlier when the planet was in opposition (i.e., nearest the earth), than when it was in conjunction (i.e., furthest from the earth), a phenomenon which could be accounted for only by the supposition that light requires 16′ 38″ to pass over a distance equal to the diameter of the Earth's orbit.

SATIATE, v. *sā'shĭ-āt* [L. *satĭātus*, filled, satiated; *satĭ-āre*, to satiate—from *satis*, enough]: to gratify fully either appetite or desire; to fill beyond want or natural desire; to glut; to surfeit. SA'TIATING, imp. SA'TIATED, pp. glutted. SA'TIABLE, a. *-ă-bl*, that may be appeased or gratified. SA'TIABLY, ad. *-blĭ*. SATIETY, n. *să-tī'ĕ-tĭ* [F. *satiété*—from L. *satĭĕtātem*, satiety]: fulness of gratification beyond desire or pleasure; surfeit; repletion.—SYN. of 'satiate': to cloy; gorge; surfeit; glut; overfill; satisfy; suffice; sate; fill; pall; gratify; saturate.

SATIN, n. *săt'ĭn* [F. *satin;* Port. *setim*, satin—from mid. L. *setinus, satinus*, satin—from L. *sēta*, a bristle]: a glossy silk cloth: a fabric in which so much of the weft is brought uppermost in the weaving as to give a more lustrous and unbroken surface to the cloth than when the warp and weft cross each other more frequently. In the figure, A are the warp threads, of which only every tenth one is raised to allow the shuttle to pass, but they all are raised in regular succession, so that the weaving is uniform throughout; B are the weft threads; C is the selvedge, formed on each



side of the piece of stuff by the regular method of plain-weaving, that is, by raising every other warp thread for the passage of the weft. The term satin is very rarely applied to any other than silk fabrics, woven as described; but there are woolen, linen, and cotton satins known in the markets. SATIN-DE-LAINE, n. black cassimere manufactured in Silesia from wool. SAT'INET, n. *-ĭ-nĕt*, a thin inferior kind of satin: also a kind of cloth woven with cotton warp and woolen weft. SATIN-JEAN, n. twilled cotton fabric, having a smooth, satiny surface. SAT'INY, a. *-ĭn-ĭ*, resembling satin. SATIN-BIRD (see BOWER-BIRD). SATIN-SPAR, a mineral, a fibrous kind of carbonate of lime, having a silky appearance when polished. SATIN-STONE (see SATIN-SPAR). SATIN-TURK, n. trade name for a superior quality of satine.

SAT'IN-WOOD: beautiful ornamental wood obtained from both the W. and E. Indies. The former is the better kind, and is supposed to be the product of a moderate-sized tree, *Ferolia Guianensis*, and probably of other species, as there are several varieties of the wood. That from the E. Indies is less white in color, and is produced by *Chloroxylon Sweitenia*. Both are much used by cabinet-makers, and for marquetry, etc. The logs are usually only 6 or 7 inches square.

Cloroxylon Sweitenia is a tree of nat. order *Cedrelaceæ*, growing on the mountains of the Circars in India, and in Ceylon. Sir James E. Tennent says that 'in point of size and durability, it is by far the first of the timber-trees of Ceylon. The richly-colored and feathery logs are used for cabinet-work, and the more ordinary for building purposes, every house in the eastern province being floored and timbered with satin-wood.'—Tennent's *Ceylon*.

SATIRE, n. *săt'īr* [F. *satire*, satire—from L. *satĭra*, *satŭra*, a satire; *satŭra*, orginally a plate filled with various kinds of fruit, hence a medley, olio, satire—from *sătur*, full]: written composition in which vice and folly are exposed to scorn and contempt (see below); keenness and severity of remark; sarcasm. SATIRIC, a. *să-tĭr'ĭk*, or SATIR'ICAL, a. *-ĭ-kăl*, conveying or containing satire; sarcastic or cutting in language. SATIR'ICALLY, ad. *-lĭ*. SATIRIZE, v. *săt'ĕr-īz*, to censure with keenness or severity. SAT'IRIZING, imp. SAT'IRIZED, pp. *-īzd*. SAT'IRIST, n. *-ĭst*, one who writes satire.—SYN. of 'satire': sarcasm; irony; lampoon; burlesque; pasquinade; wit; humor; ridicule; parody; travesty; caricature; comedy;—of 'satirical': cutting; severe; abusive; sarcastic; ironical: bitter: poignant; reproachful; censorious.

SAT'IRE: name given by the Romans to a species of poetry of which they may be considered inventors. The word *satura* (from the root *sat*, enough) is strictly and originally an adjective, meaning 'full' or 'filled;' but afterward it came to possess also a substantive signification, and denoted a dish filled with a medley of ingredients, like the *Pot-pourri* (q.v.) of the French, or the *Olla-podrida* (see OLLA) of the Spaniards. Hence, in its figurative application to a branch of literature, it throws a light on the primary character of that literature. The oldest Roman S. was a medley of scenic or dramatic improvisations in varying metres (Livy, lib. 7, cap. 2), like the Fescennine Verses (q.v.); but the sharp banter and rude jocularity of these unwritten effusions bore little resemblance, either in form or spirit, to the earnest and acrimonious criticism that formed the essential characteristic of the later S. The earliest—so far as we know—who wrote *saturæ*, were Ennius (q.v.) and Pacuvius; but the metrical miscellanies of these authors were little more than serious and prosaic descriptions, or didactic homilies and dialogues. Lucilius (B.C. 148–103) is universally admitted to be the first who handled men and manners in that peculiar style which has ever since been recognized as the satirical: and the particular glory of

Lucilius, in a literary view, was that he created a special kind of poetry, which in all subsequent ages has been the terror and aversion of fools and knaves. The serious, and even saturnine gravity of the Roman mind must have readily disposed it to a censorious view of public and private vices. After the death of Lucilius, S., as well as other forms of literature, languished, and we meet no satirist of note till the age of Horace (q.v.), whose writings are as a glass in which we behold mirrored the tastes and habits of the Augustan age. His S., though sharp enough at times, is in the main humorous and playful. It is different when we come to Juvenal (q.v.)—a century later, when S. became a *sæva indignatio*, a savage onslaught on the tremendous vices of the capital. Persius (q.v.), who lived in the generation before Juvenal, is every way inferior in genius to the latter. After Juvenal, we have no professed satirist, but several writers, prose and poetic, in whom the satiric element is found, of whom Martial the epigrammatist is perhaps the most notable.

During the middle ages, the satirical element showed itself abundantly in the general literature of France, Italy, Germany, England, and Scotland. Men who have a claim to the character of satirists, *par excellence*, are Ulrich von Hutten, one of the authors of the *Epistolæ Obscurorum Virorum* (q.v.), Erasmus (q.v.), Rabelais (q.v.), Sir David Lindsay (q.v.), George Buchanan (q.v.). In all of these writers, priests are the special objects of attack: their vices, their greed, their folly, their ignorance, are lashed with a fierce rage. But it was in France that S. as a formal literary imitation of antiquity first appeared in modern times. Vauquelin (q.v.) may be considered the true founder of modern French S. The satirical verses of Mottin, of Sigogne, and of Berthelot, of Mathurin Regnier, *L'Espadon Satirique* of Fourqueraux, and *Le Parnasse Satirique*, attributed to Théophile Viaud, are very impure in expression, and remind us that at this time a S. was understood to be an obscene work—the 17th c. scholars supposing that the name had something to do with Satyr, and that the style ought to be conformed to what might be thought appropriate to the lascivious deities of ancient Greece. During the 17th and 18th c., both England and France produced professed satirists of the first rank, who have not been surpassed by the best either of their predecessors or successors. The names of Dryden (q.v.), Butler (q.v.), Pope (q.v.), and Churchill (q.v.) on one side of the Channel, of Boileau (q.v.) and Voltaire (q.v.) on the other, are well known. Dr. Edward Young (q.v.) and Dr. Johnson (q.v.) also have made a name for themselves in this branch of literature. It was a distinguishing characteristic of Dryden, Boileau, Young, Pope, Churchill, and Johnson, and a mark of the difference of the times in which they lived from those of the satirists of the Reformation, that it is no longer the church that is assailed, but society, political opponents, literary rivals, etc.; the war is carried on, not so much against bad morals in the clergy, as against the common vices of men in general, or

it is even the expression of partisan hatreds. Swift (q.v.) and Arbuthnot (q.v.) are perhaps as great satirists as any above mentioned.

S. in the form of political squibs, lampoons, etc., is abundant in the 17th and 18th c. Butler's *Hudibras* is simply one long lampoon against the Puritans; most of the playwrights of the Restoration were royalist satirists —unscrupulous and indecent partisans. Dryden himself was *facile princeps* of the herd. Andrew Marvell (q.v.) is the most famous name on the side of liberty. The *Beggar's Opera* of the poet Gray is a piece of very fine political S. Gifford (q.v.), and Wolcot (q.v.), better known as Peter Pindar, also deserve mention, though their intrinsic merits are small. Incomparably superior to all their contemporaries, and among the first order of satirists, are Robert Burns (q.v.) and Cowper (q.v.).—Meanwhile, in France, since Voltaire, no great name has appeared, except, perhaps, that of Béranger (q.v.), though the spirit of S. has pervaded most of the current literature, particularly political literature. In Germany, the most conspicuous modern names are those of Hagedorn, Rabener, Sturz, Stolberg (q.v.), Kästner, Wieland (q.v.), Tieck (q.v.), and Goethe (q.v.); but none of these have adhered very strictly to the classic models of S. Of 19th c. satirists in England, the best names are Byron (q.v.), the brothers Smith (q.v.) and Hood (q.v.), in poetry; and Hook (q.v.), Jerrold (q.v.), Thackeray (q.v.), and Carlyle, (q.v.), in prose. In the United States there have been many satirists of minor rank, and the name of the author of the *Biglow Papers*, James Russell Lowell, is among the most eminent of modern satirists.—In journalistic and pictorial satire London *Punch* has led a numerous line of followers.—See Sellar's *Roman Poets of the Republic* (2d ed. 1881); Browne's *History of Roman Classical Literature* (Lond. 1853); Thomson's *History of Roman Literature* (a vol. of the *Encyclopædia Metropolitana*); Mommsen's *History of Rome;* Niebuhr's *Lectures on Roman History;* M. Viollet le Duc, article 'Satire' in *Dictionaire de la Conversation:* and James Hannay's *Satire and Satirists.*

SATISFY, v. *săt'ĭs-fī* [OF. *satisfier*, to satisfy—from L. *satisfacĕrĕ*, to satisfy—from *satis*, enough; *facĭō*, I make: F. *satisfaire*: Sp. *satisfacer*]: to afford full gratification to; to supply fully; to pay all claims to the full extent; to appease by punishment; to convince; to give content; to release from suspense. SAT'ISFYING, imp. SAT'ISFIED, pp. *-fīd*. SAT'ISFIER, n. *-fī-ĕr*, one who gives satisfaction. SAT'ISFAC'TION, n. *-făk'shŭn* [F.—L.]: the act of satisfying; the condition of mind resulting from full gratification of desire, or from release from suspense or doubt; amends; atonement; recompense; the settlement of a claim; the satisfying of one's honor by means of a duel; payment. SAT'ISFAC'TORY, a. *-tĕr-ĭ*, yielding content; gratifying; causing conviction. SAT'ISFAC'TORILY, ad. *-ĭ-lĭ*. SAT'ISFAC'TORINESS, n. *-nĕs*, the quality or condition of being satisfactory. SAT'ISFYINGLY, ad. *-lĭ*, in a manner tending to satisfy.—SYN. of 'satisfaction': compensation; recompense; amends; contentment; gratification; pleasure; content; remuneration; requital; reward; meed; guerdon; indemnification; atonement;—of 'satisfy': to gratify; humor; indulge; please; satiate; glut; cloy; content; sate.

SATOLLI, *sâ-tol'lē*, FRANCIS, cardinal: 1839, July 21—; b. Marciano, Italy. Joachim Pecci, abp. of Perugia (now Leo XIII.), directed his education for the church, and after ascending the papal throne chose him as assistant in promoting theological study. S. was prof. in the urban col. of the Propaganda at Rome, and in 1888 was made abp. of Lepanto; represented the pope at the opening of the Cath. Univ. of America, at the Rom. Cath. congress, and at the Baltimore diocesan centennial 1889; and 1892 was appointed apostolic delegate to the U. S. with pontifical power. In 1896 he was made cardinal, and was succeeded as apostolic delegate by Mgr. Martinelli (q.v.).

SA'TRAP, n. *sā'trăp* [F. *satrape*—from L. and Gr. *satrapēs*, the governor of a province—originally a Persian word]: in the ancient Persian monarchy, the governor of a province, whose power—so long as he kept the favor of the king—was almost absolute. He levied taxes at his pleasure, and could ape the tyranny of his great master without hindrance. When the monarchy of Cyrus began to decline, some of the satraps threw off their slight allegiance, and founded independent kingdoms or sultanates of their own, the most famous of which in ancient times was the Mithridatic kingdom of Pontus (see PONTUS: MITHRIDATES). SATRAPAL, a. *sā'trā-păl*, pert. to a satrap. SA'TRAPY, n. *-pĭ*, the government of a satrap.

SATSUMA, *sât-sō'mâ*: province of the island of Kiushiu, in the s. part of Japan. In early feudal times the lords held a large part of Kiushiu, but their territory was greatly reduced in the 16th c., though early in the 17th c. they secured control of the Loo Choo Islands. The people have had many able leaders and have long been noted for knowledge and zeal in military matters, and for their opposition to govt. usurpations. The efforts of the govt. to suppress the attempts of the more advanced leaders in

Satsuma to introduce western civilization led indirectly to the difficulty with Great Britain 1863, and to the great revolution of 1868. The people of Satsuma were prominent in the movement which led to the overthrow of the feudal system 1872, and they led in the rebellion of 1877, which was caused by the course of the rulers in regard to the Corean troubles, and by dissatisfaction with their management of domestic affairs. Satsuma has more readily adopted foreign customs, and has sent abroad more students to be educated, than any other province of Japan. The country is mountainous, and the soil is of only moderate fertility; but there is great mineral wealth, manufactures are flourishing, and there is an extensive and profitable commerce. The famous decorated pottery known as Satsuma ware has nearly all been made by Coreans, many of whom were prisoners.

SATSUMA WARE: a fine kind of pottery or semi-porcelain made in Japan, having a felspathic glaze of a light straw color, the surface of which is covered with a net-work of fine cracks. Red and green colors and dulled gold are employed for decorating the ware. Fine old Satsuma ware is highly esteemed by collectors.

SATTEEN, n. See SATEEN.

SATTERLEE, *săt'tėr-lē,* HENRY YATES: American Protestant Episcopal bishop: b. New York 1843, Jan. 11; d. Washington, D. C., 1908, Feb. 22. He was graduated from Columbia in 1863, ordained in the priesthood in 1867, was assistant rector at Zion Church, Wappinger's Falls, 1865-75, and rector there 1875-82. From 1882-96 he was rector of Calvary Church, New York, and till his death was bishop of Washington. He was elected bishop coadjutor of Ohio in 1887 and bishop of Michigan in 1899, but declined both positions. His publications include: *Christ and His Church; New Testament Churchmanship; The Calling of a Christian;* etc.

SATTERLEE, WALTER: American artist: b. Brooklyn, N. Y., 1844, Jan. 18; d. 1908, May 28. He first exhibited at the National Academy in 1868, and in 1886 won the Clarke prize. His more noteworthy pictures are *Contemplation; His Eminence the Cardinal; The Peacemaker; Marguerite;* and *Love Making in Capri.*

SATTERTHWAITE, *săt'tėr-thwāt,* THOMAS EDWARD, M.D.: born Spuyten Duyvel, N. Y., 1843, Mar. 26. He graduated from Yale College 1864, studied medicine in New York, was a surgeon in the Franco-German war, and was afterward connected with St. Luke's Hospital and the Presbyterian Hospital in New York. He has written important papers for medical publications, and 1876 received a prize from the College of Physicians and Surgeons for an essay *On the Structure and Development of Connective Substances.* Other works are: *Manual of Histology* (1881); *Practical Bacteriology* (1887), and *Diseases of the Heart and Aorta* (1905).

SATURATE, v. *săt'ū-rāt* [L. *satŭrātus*, glutted, satiated: *satŭrārĕ*, to glut—from *sātur*, full or filled: It. *saturare*: F. *saturer*]: to supply or add to fulness; to impregnate with till no more can be received. SAT'URATING, imp. SAT'URATED, pp. SAT'URABLE, a. *-rā-bl*, that may be saturated. SAT'URANT, a. *-rănt*, impregnating to the full: N. a substance which neutralizes the acid in the stomach. SAT'URA'TION, n. *-rā'shŭn* [F.—L.]: the condition of a body in which it has received as much of another substance as it can contain or dissolve.

SATURDAY, n. *săt'ĕr-dā* [AS. *Sæter-dæg*, Sæter's day, Saturday—from *Sæter*, one of the Norse deities equivalent to Saturn; *dæg*, a day: Dut. *zaturdag*]: seventh or last day of the week, coincident with the sabbath day of the Jews; hence the 7th day is still in the Roman calendar. *Dies Sabbati* (sabbath day), and the meaning of the German name of the day is the same: *Samstag* = sambattag (sambat = sabbat). See SABBATH.

SATURN, n. *săt'ĕrn* [L. *Satur'nus*, Saturn]: in *anc. myth.*, one of the oldest and chief gods, under whom the golden age was supposed to have existed (see below). —Also one of the planets, next in magnitude to Jupiter (see PLANETS): in *her.*, the black color in the arms of sovereign princes. SATURNALIA, n. *săt'ĕr-nā'lĭ-ă*, in *anc Rome*, the annual festival of Saturn—a period of unrestrained revelry for all classes, even slaves (see below). SAT'URNA'LIAN, a. *-ăn*, free; loose; dissolute. SATURNIAN, a. *sā-tĕr'nĭ-ăn*, pertaining to Saturn or the golden age; happy; pure. SATURNINE, a. *săt'ĕr-nīn*, under the influence of the planet Saturn; dull; gloomy; phlegmatic. SATURNINE-PALSY, n. *săt'ĕr-nīn:* in *pathol.*, lead palsy produced by the inhalation of lead particles. SAT'URNIST, n. *-nĭst*, a person of a dull grave temperament. SATURNUS, n. *sa-tĕr'nŭs* [L.]: Saturn.

Saturn.

SATURN, n.: in *old chem.*, name applied to lead

SATURN, *săt'ĕrn:* ancient Italian divinity, who presided over agriculture. His name, from the same root as *satum* [*sero*, to sow], indicates what was probably one of the earliest personifications in the Italian religion, S. being the god who blessed the labors of the sower. His (till recently universal) identification with the Greek KRONOS in accordance with the later Græcizing myth-mongers, is a peculiarly infelicitous blunder, and has led to great confusion. The Greek *Demeter* (Ceres), it has been observed, approaches far more closely to the Italian conception of the character of S. The process of amalgamation in the case of Kronos and S. is visible enough. First, there is the Greek myth. Kronos, son of Uranos (Heaven) and Gaea (Earth), is there the youngest of the Titans. He

married Rhea, by whom he had several children, all of whom he devoured at birth except the last, Zeus (Jupiter), whom his mother saved by a stratagem. The motive of Kronos for this horrible conduct was his hope of frustrating a prophecy which declared that his children would one day deprive him of his sovereignty, as he himself had done in the case of his father Uranos; but fate is stronger even than the gods, and when Zeus had grown up, he began a great war against Kronos and the Titans, which lasted ten years, and ended in the complete discomfiture of the latter, who were hurled down to Tartarus, and there imprisoned. So ran the common myth. But other myths added that, after his banishment from heaven, Kronos fled to Italy, where he was received hospitably by

Saturn.—Raphael.

Janus, who shared his sovereignty with him. At this point the Greek myth coalesced with the Italian. S., the old homely deity of the Latin husbandmen, was transformed into a divine king, who ruled the happy aborigines of the Italian peninsula with paternal mildness and beneficence, taught them agriculture and the usages of a simple and innocent civilization, and softened the primitive roughness of their manners. Hence the whole land received from him the name of *Saturnia*, or 'land of plenty.' His reign was that 'golden age' of which later poets sang as the ideal of earthly happiness, and in memory of which the famous *Saturnalia* (q.v.) were thought to have been instituted. At the foot of the Capitoline, where the fugitive god had formed his first settlement, there stood in historical times a temple dedicated to his worship. According to the old legends, human sacrifices were sometimes offered to him. Ancient artists represented him as an old man, with long, straight hair; the back of his head covered, his feet swathed in woolen ribbons, a pruning-knife or sickle-shaped harp in his hand. Other attributes, as the scythe, serpent, wings, etc., are of later invention.

SAT'URN: sixth of the planets in the order of distance from the sun: for general view of Saturn, see PLANETS.—The rings of Saturn are streams of satellites relatively minute. These rings may be broadly divided into three, the exterior ring separated from the middle one by a space free from the satellite streams, while the inmost ring and the middle seem to be in contact. The rings differ greatly in brightness: the middle ring is more luminous than the planet itself; the inmost ring is of dusky-purple tinge; the outermost of grayish tinge. Both the outermost and the middle rings are opaque; the inmost ring is transparent. The outermost ring has an exterior diameter of 173,500 m., and an interior diameter of 152,500: hence its breadth is 10,000 m. The breadth of the middle ring is 10,150 m., and of the inmost ring 18,300 m. The thickness of the ring system is probably not more than 100 m. When the position of Saturn brings the plane of the ring to pass through the centre of the sun, the edge only—100 m. thick—is illuminated: at the distance of the planet from the earth, that thickness would present to the eye a line of light visible only by the aid of the best telescopes—a line equal in diameter to the diameter of a pinhead at the distance of 2 m. But the rings nearly or quite disappear from our view when their plane passes through the earth.

SATURNALIA, *săt-ėr-nā'lĭ-a:* ancient Italian festival, instituted, according to the common belief of the ancients, in memory of the happy reign of Saturn. Discarding all mythical explanations of the institution of the Saturnalia as simply incredible, and not worth refutation, we may rationally conjecture that the Saturnalia was a rural festival of the old Italian husbandmen, commemorative of the ingathering of the harvest, or more probably in celebration of the winter solstice—therefore in either case of immemorial antiquity. It is not, we conceive, to be doubted for a moment that the untrammelled jollities of the Saturnalia were familiar to the farmers of Latium long before their homely national god, who blessed the labors of seed-time with abundant fruit, had been decorated with incongruous Hellenic honors, and transformed into a skyey Titan. Later ages may have introduced novel elements into the Saturnalia, befitting the hybrid myth of King Saturn; but it may well be believed that, originally, the cessation from toil, and the wild self-abandoning mirth that marked the feast, were expressive of the laboring man's delight that the work of the year was over, and not of an artificial enthusiasm for a 'golden age' that never had been. The great feature of the Saturnalia, as a festival in historical times, was the temporary dissolution of the ordinary conditions of ancient society. The distinctions of rank disappeared or were reversed. Slaves were permitted to wear the *pileus*, or badge of freedom, and sat down to banquets in their master's clothes, while the latter waited on them at table.

Crowds of people filled the streets, and roamed about the city in a peculiar dress, shouting *Io Saturnalia;* sacrifices were offered with uncovered head; friends sent presents to each other; all business was suspended; the law-courts were closed; school-boys got a holiday; and no war could be begun. During the Republic, the Saturnalia proper occupied only one day—Dec. 19 (xiv. Kal. Jan.). The reformation of the calendar by Julius Cæsar caused the festival to fall on Dec. 17 (xvi. Kal. Jan.), a change which produced much confusion, in consequence of which Emperor Augustus ordained that the Saturnalia should comprise the three days of Dec. 17, 18, 19. Subsequently the number was extended to five, and even seven; though even in the times before the Empire, the amusements often appear to have lasted several days. But while the whole week was regarded in a general sense as devoted to the Saturnalia, three distinct festivals were really celebrated—the Saturnalia proper; the *Opalia,* in honor of *Ops,* wife of Saturn, and goddess of field-labor [from *opus,* a work]: and the *Sigillaria,* in which *sigilla,* or little earthenware figures, were exposed for sale, and purchased as children's toys. The modern Italian Carnival (q.v.) seems to be only the old pagan Saturnalia baptized into Christianity.

SATUR'NIAN VERSE: name given by the Romans to that species of verse in which their oldest poetical compositions, particularly the oldest national poetry, were composed. In the usage of the later poets and grammarians, the phrase has two different significations. It is applied in a general way to denote the rude and unfixed measures of the ancient Latin ballad and song; and perhaps derived its name from being originally employed by the Latin husbandmen in their harvest-songs in honor of the god Saturn (q.v.). In this sense, it simply means *old-fashioned,* and is not intended to determine the character of the meter. It is applied also to the measure used by Nævius, and a common opinion, sanctioned by the great name of Bentley, is, that it was a Greek meter introduced by him into Italy. But though the Saturnian Verse is found among the measures employed by Archilochus, scholars generally incline to the opinion that this is an accidental coincidence, that the measure of Nævius is of Italian (Hermann thinks even of Etruscan) origin, and that it merely improved on the older ballad-meter—the primitive Saturnian Verse. It continued in use till the time of Ennius (q.v.), who introduced the Hexameter (q.v.). According to Hermann, the basis of the verse is contained in the following *schema:*

⌒ , ⏑ — ⏑ ⏑ ⏑ | — ⏑ — ⏑ — ⏑,

which, as Macaulay happily points out, corresponds exactly to the nursery rhyme,

The queén was in her párlor | éating bréad and hóney,

and is frequently found in the Spanish poem of the *Cid,*

the *Nibelungen Lied,* and almost all specimens of early poetry; but in the treatment of it a wide and arbitrary freedom was taken by the old Roman poets, as is proved by still extant fragments. See *History of Roman Literature,* by Thompson, Arnold, Newman, etc. (*Encyclopædia Metropolitana,* 1852); Browne's *History of Classical Roman Literature* (1853); Niebuhr's *History of Rome;* Preface to Macaulay's *Lays of Ancient Rome;* and Sellar's *Roman Poets of the Republic* (1863, new ed. 1881).

SATYR, n. *săt'ėr* [L. *sat'yrus:* Gr. *sat'ŭros,* a satyr], in Greek Mythology: one of a race of sylvan and minor deities, mentioned first by Hesiod, who designates them 'the race of worthless satyrs unfit for work.' Subsequently they figure in great numbers in the train of Dionysus (Bacchus)—their leader being that model of tipsy revellers, the never-sober Silenus. In appearance they were grotesque and repulsive, like all old woodland demons. They are described as robust in frame, with broad snub noses, large pointed ears like those of animals (whence they are sometimes called *theres,* 'wild beasts'), bristly and shaggy hair, rough skin, little horny knobs on their foreheads, and small tails. The satyrs are of course sensual in their inclinations, and ravishers of the woodland nymphs, fond of music, dancing, wine, and of the deep slumbers that follow a debauch. The Roman poets identified them with the *Fauni* of their own mythology, and gave them larger horns and those goats' feet with which they are so often represented. Ancient sculpture was fond of the satyr as a 'subject'—one of the most famous specimens being the satyr of Praxiteles (q.v.), though in this the more ancient savage repulsiveness is toned down by something of youthful grace.—The satyr of the authorized version in Is. xiii. 21, xxxiv. 14 [Heb. 'hairy one'], denotes a supposed shaggy demon, gloomy and terrible, inhabiting waste places. The same word is in Lev. xvii. 7. SATYRIC, a. *să-tĭr'ĭk,* or SATYR'IAN, a. *-ĭ-ăn,* of or relating to satyrs, as the *satyric* drama of the Greeks.

SATYRIASIS, n. *săt'ĭ-rī'ă-sĭs* [Gr.]: lecherous madness in males; satyr-like lasciviousness; excessive and ungovernable sexuality in the male—a form of mental alienation.

SAUCE, n. *saws* [F. *sauce*—from It. and mid. L. *salsa,* a mixture of salt and spices, any relishing addition to food—from L. *salsus,* salted; *sal,* salt]: a liquid mixture to be eaten as a condiment or seasoning for food, in use from the earliest times of culinary art; anything that stimulates the palate: *familiarly,* insolence; pertness; petulance: V. to season or eat with sauce; to treat with pertness. SAU'CING, imp. SAUCED, pp. *sawst.* SAUCER, n. *saw'sėr* [F. *saucière,* a saucer—from mid. L. *salsarĭum*]: a little dish to hold sauce; a shallow piece of earthenware in which a cup is set. SAU'CY, a. *-sĭ,* rude; impertinent; disrespectful; petulant; care-for-nobody.

SAU'CILY, ad. *-sĭ-lĭ.* SAU'CINESS, n. *-nĕs,* the quality of being saucy; impertinent boldness. SAUCE BOATS and TUREENS, small earthenware vessels for holding sauces and gravies. SAUCEPAN, an iron cooking utensil with projecting handle. TO SERVE ONE WITH THE SAME SAUCE, to retaliate one injury with another.—SYN. of 'sauciness': rudeness; impertinence; impudence; insolence; audacity; petulance.

SAUCH, or SAUGH, n. *sawch* [Sw. *sälg;* OF. *saulg;* L. *salix* or *salīcem,* the willow]: in *Scot.,* the willow; also applied to the *sallow,* which see.

SAUCISSE, n. *sō'sĭs',* or SAUCISSON, n. *sō-sĭs'ŏng* [F. *saucisse,* a sausage (see SAUSAGE)]: in *mil.,* long pipe or tube of pitched cloth or leather an inch or more in diameter filled with gunpowder, and used for firing a mine; one end is laid in the mine to be exploded, the other is conducted through the galleries to a place where the engineers can safely fire it. Electricity is now preferred (see BLASTING). Saucisse is also an unusually long bundle of fagots, for keeping up the earth in erection of batteries.

SAUCY. See under SAUCE.

SAUERKRAUT, n. *sowr'krowt* [Ger. *sauer,* sour; *kraut,* a vegetable, cabbage]: preparation of the common white cabbage, in extensive use in Germany and n. Europe, where it supplies during the winter the place of fresh vegetables. The cabbages are gathered when they have formed firm white hearts: these, sliced into thin shreds, are placed in a succession of thin layers in a cask, each layer sprinkled with fine salt, to which some add juniper berries, cumin seed, caraway seeds, or other condiment. A board is then placed on the top, with a heavy weight, pressing the whole down firmly, but gently. After a time, fermentation begins; and when a sour smell arises from the cask, it must be removed into a cool place.

SAUGERTIES, *saw'ghĕr-tēz:* village in Saugerties tp., Ulster co., N. Y.; on the Hudson river, where it receives Esopus creek, and opposite Tivoli, with which it is connected by a steam ferry; and on the West Shore railroad, 12 m. above Kingston, 100 m. from New York. It has several churches, an institute and good public schools, daily and weekly newspapers, two banks, and large manufactures, including paper and iron. The water-power is abundant, there are quarries of fine limestone in the vicinity, and small fruits are shipped from this point to city markets. Pop. (1900) 3,697; (1910) 3,929.

SAUGUS: Mass.; town in Essex co.; on Lynn Harbor and Saugus river, and on the Boston & Maine railroad; about 4 m. w. of Lynn and 10 m. n.e. of Boston. Within its corporate limits are the villages of East Saugus and Cliftondale. It is a residential section with several manufacturing establishments, chief of which are woolen mills, and boot and shoe factories. The town has a high school and graded elementary schools. Pop. (1910) 8,047.

SAUL, *sawl:* first King of Israel (reigned about B.C. 1096-1056): d. B.C. 1056; son of Kish, a wealthy chief of the tribe of Benjamin. For the events of his life from his election to the royal dignity, see I Sam. x-xxxi.: also DAVID; SAMUEL; JEWS. Gigantic in stature, noble in mien, and imperious in character, he appeared admirably fitted to accomplish the task of consolidating the dislocated tribes of Israel. His earlier achievements augured hopefully for his future. His deliverance of the men of Jabesh-Gilead, and his great victories over the Philistines, the Moabites, Ammonites, Edomites, and Amalekites, showed vigorous military capacity; but gradually there developed itself in the nature of the man a wild perversity—'an evil spirit of God,' as it is called—culminating in paroxysms of insane rage, which led him to commit such frightful deeds as the massacre of the priests of Nob. Saul's history became a tragedy. Samuel, who had retired from the 'court' of Saul, and had secretly anointed David as king, did not cease to 'mourn' for the wayward monarch; but nothing availed to stay his downward career, not even the noble virtues of his son Jonathan; and at last he fell in a disastrous and bloody battle with the Philistines on Mount Gilboa.

SAULLIE. See SALLIE.

SAULT, n. *sawlt* or *sō* [OF. *sault;* mod. F. *saut,* a leap —from L. *saltus,* a leap—from *salio, saltum,* to leap]: a rapid in some rivers.

SAUL TREE. See SAL.

SAULT STE. MARIE, *sô sĕnt mā'rĭ,* F. *sō săngt mârē',* or SAULT DE STE. MARIE: city, capital of Chippewa co., Mich.; on St. Mary's Strait (q.v.) and the St. Mary's ship-canal, and on the Duluth, South Shore & Atlantic and the Minneapolis, St. Paul & Sault Ste. Marie railroads; nearly 15 m. from the outlet to Lake Superior. There are six churches, a high school, one daily and one weekly paper, one savings bank and one national bank. Water is supplied by the Holly system; there are street-cars; the streets are lighted by electricity; and there is excellent drainage. The surrounding region is rich in timber and minerals. Fishing is the leading interest, but there are several lumber-mills and considerable commerce. The first settlement was made 1665. Pop. (1910) 12,615.

SAULT SAINTE MARIE: Canada; town and port of entry of Algoma District, Ontario; on the Saint Mary river, the Sault Sainte Marie canal, and on the Canadian Pacific and Algoma Central railways. It is connected by the international bridge, 1 m. long, with Sault Sainte Marie, Mich., hence with the Duluth, South Shore & Atlantic and the Minneapolis, Saint Paul & Sault Sainte Marie railways. It is in an agricultural and mining region and is a popular summer resort. In addition to the ship canal around the rapids, Sault Sainte Marie has a large power canal, which already supplies important

industries and will supply power to future manufactories. The most important industry is the manufacture of wood-pulp and paper, the large mill at Sault Sainte Marie having cost in construction more than $1,000,000 and being one of the largest in the world. There are also nickel steel works, utilizing the nickel ores from the Sudbury mines, foundry and machine shops, and lumber mills. The city owns and operates its electric lighting plant and water works. It is the seat of the Anglican Bishop of Algoma and the Roman Catholic Bishop of Northern Canada; has good schools, banks, and weekly newspapers. Pop. (1901) 7,169.

SAULT STE. MARIE CANAL: a canal uniting Lake Superior with the other great lakes. The enterprise originated 1892, through a grant of public lands amounting to 750,000 acres, which was made by the state of Michigan for the purpose of defraying the expenses of its construction. For the amount derived from the sale of these lands a private company contracted with the state to build the canal, ground for which was broken 1853, June 4, the work being completed 1855, May 21. The original canal was 5,400 feet long, 100 feet wide, and 12 feet deep, and its entire cost was $999,802.46. Between the years 1870 and 1881 the waterway was widened and deepened and a new lock (then the largest ship-canal lock in the world) was built, bringing the total cost of the canal to $2,150,000. The dimensions of the canal are 7,000 feet long, 108 feet wide, and 16 feet deep. The chamber of the old lock is 515 feet long, 80 feet wide, and 39½ feet deep, with a capacity of 1,500,000 cubic feet. The capacity of the lock for vessels ranging 800-1,200 tons is about 96 vessels per day; 11 minutes are required to fill and 8 minutes to empty the lock. The canal continued to be owned by the state of Michigan till 1881, June 6, when by act of congress it passed under the control of the general government. The action of the Canadian government in discriminating against the commerce of the United States in regard to the Welland and St. Lawrence canals through excessive canal tolls and vexatious regulations, brought under general public consideration the vast importance of the great work of the enlargement of the canal and its locks, which began in the spring of 1887. The tonnage of vessels passing through the canal has greatly increased with the completion of the new government lock officially opened 1896. This lock measures 1,000 feet in length between the gates, 100 feet in width, and 43½ feet in depth, with an estimated capacity of 3,440,000 cubic feet. The canal has also been deepened to a navigable depth of 21 feet. Cost of improvements about $5,000,000. The Canadian government has completed and opened a new canal on the Canadian side of the river, giving a clear channel for vessels drawing 14 feet through Canadian territory from Lake Superior to the sea. See SUEZ CANAL.

SAUMAREZ, *sō-mâ-rā'* (or SAUSMAREZ, *sō-mâ-rā'*), JAMES, Baron DE: English naval hero: 1757, Mar. 11—1836, Oct. 9; b. in the island of Guernsey; descended from an old French family long settled there. He entered the navy as midshipman at the age of thirteen, and served in the American war (1774-82), receiving for his gallantry at the attack of Charleston (1775) the grade of lieutenant. He was promoted commander 1781, and soon afterward placed on the Jamaica station. At the great fight between Rodney and De Grasse (1782, Apr. 12), Saumarez commanded the *Russell*, line-of-battle ship, with much distinction. For his gallant capture of the French frigate *La Reunion*, with one inferior in size and equipment, he received knighthood. He was in command of the *Orion*, a seventy-four, at the battle of l'Orient 1795, was prominent in the battle off Cape St. Vincent 1797, and was second in command under Nelson at the battle of the Nile, in which he was severely wounded. In 1801 he became a baronet, and vice-admiral of the blue, and fought his greatest action off Cadiz (July 12), defeating a French-Spanish fleet of 10 line-of-battle ships and 4 frigates, with a squadron less than half their strength, and causing to the enemy a loss of 3,000 men and three ships. This contest, than which, according to Admiral Nelson, 'a greater was never fought,' gained for Saumarez the order of the Bath, the freedom of the city of London, and the thanks of parliament. In the Russian war, he commanded the Baltic fleet, and took or destroyed two large Russian flotillas (1809). In 1814 he became admiral, vice-admiral of Great Britain 1821, a peer 1831, and died at Guernsey. See Life by Sir John Ross (*Memoirs of Admiral Lord de Saumarez*, 2 vols. 1838).

SAUMUR, *sō-mür'*: town of France, on the left bank of the Loire, department of Maine-et-Loire, 38 m. s.w. of Tours, 28 m. s.e. of Angers by railway. Bridges connect the town, which is partly on an island, with both banks of the river. The river-side is lined with handsome quays, and there are good bridges and agreeable promenades. There is a great cavalry school, in which riding-masters for the army are trained. The hôtel-de-ville and the castle are prominent buildings. Rosaries of cocoa-nut shell and articles in enamel are manufactured. The trade of Saumur is in spirits, wines, hemp, and linen. Pop. 16,250.

Saumur, former capital of the province of Saumurois, was a stronghold of the Protestants during the reign of Henry IV., at which time its pop. was 25,000. Its prosperity was annihilated by the revocation of the Edict of Nantes, and its population reduced to a fourth. Perhaps the most striking event in the history of the town was its brilliant capture by Laroche-jaquelein and the Vendeans, 1793, June 10. In this action, the victors, with slight loss, captured 60 cannon, 10,000 muskets, and 11,000 republicans.

SAUNDERS, *sawn'dėrz,* FREDERICK: author: 1807, Aug. 14; b. London, England; d. 1902. He came to New York 1837 and engaged in publishing, but afterward became city editor of the *Evening Post.* In 1859 he was appointed assistant librarian of the Astor Library, and 1876 chief librarian. Mr. Saunders was a frequent contributor to periodicals, and published, among other works, *Memoirs of the Great Metropolis, or London from the Tower to the Crystal Palace* (1852); *New York in a Nutshell* (1853); *Homes of American Authors* (1853); *Salad for the Solitary* (1854); *Salad for the Social* (1856); *Pearls of Thought* (1858); and *Festival of Song* (1865).

SAUN'DERS, PRINCE: educator and lawyer, of negro race: about 1775-1840, Feb. 12; b. Thetford, Vt. He was well educated, taught school in Connecticut and in Boston, removed to Hayti 1807, and was soon afterward employed by the president of the republic to obtain teachers and books from England and improve the educational methods of the country. After a short stay at Hayti, he returned to the United States, studied theology, and preached in Philadelphia. Again going to Hayti, he practiced law, became attorney-general, and held the office till his death. He arranged a valuable criminal code for the government. Among his books were *Documents Relative to the Kingdom of Hayti* (1816), *Haytian Papers* (1818).

SAUNDERS-BLUE, n. plu. *sawn'dėrz-blô* [corruption of F. *cendres bleues,* blue ashes]: a sort of color prepared from calcined lapis-lazuli.

SAUNDERSON, *sawn'dėr-son,* NICHOLAS, LL.D.: English mathematician: 1682, Jan.—1739, Apr. 19; b. Thurleston in Yorkshire. He became blind from smallpox at the age of about one year, but received a good education, including the classics, which was orally communicated. By the aid of his friends, he learned arithmetic, geometry, and algebra, by means of ingenious mechanical contrivances. In 1707 he came to Christ's College, Oxford, as a teacher, and there delivered a series of lectures on the Newtonian philosophy, including (strangely) a discussion of Newton's theory of optics. Four years afterward he succeeded Whiston as Lucasian professor of mathematics. A valuable and elaborate treatise on Algebra, from his pen, was published 1740 (2 vols. 8vo), and another on Fluxions, including commentary on parts of Newton's *Principia* 1756. The mental process by which he was enabled to understand the rules of perspective, the projections of the sphere, and some of the more recondite propositions of solid geometry seems to have been peculiar to himself, and was almost unintelligible to others. His senses of hearing and of touch were extremely acute: he could judge fairly of the size of a room and of his position in it by the sound of his own footsteps.

SAUNDERS-WOOD. See SANDERS.

SAUNTER, v. *sân'tĕr* [Sw. *slentra*, to wander about: Ger. *schlendern*, to saunter: Dan. *slunte*, to idle]: to wander or stroll about idly; to loiter; to lounge: N. a stroll. SAUN'TERING, imp.: ADJ. listlessly loitering: N. the act or habit of one who saunters. SAUN'TERED, pp. *-tĕrd*. SAUN'TERER, n. *-tĕr-ĕr*, one who wanders about idly.

SAUR, n. *sawr* [etym. doubt.]: soil; dirt; dirty water.

SAURIA, *saw'rĭ-a:* in the systems of Cuvier and other recent naturalists, an order of Reptiles (q.v.), having an elongated body, covered with scales or with bony plates; a more or less elongated tail; four limbs, or sometimes only two apparent, the rudimentary hind-limbs being concealed beneath the skin; the mouth always furnished with teeth; the ribs movable, rising and falling in respiration; the young issuing from the egg in a form similar to that of the mature animal.—To this order belong Crocodiles, Alligators, etc.; Chameleons, Geckoes, Iguanas, Agamas, Varans, Teguixins, Lizards, Skinks, etc., numerous families, some of which contain many genera and species. Crocodiles and their allies, being covered with bony plates instead of overlapping scales, are by some naturalists removed from the Saurians, and placed nearer the Chelonians; but in general form and structure they correspond with Saurians, and have no resemblance to Chelonians. The recent S. are far excelled in size and in variety of strange forms by the fossil S., e.g., *Plesiosaurus*, *Ichthyosaurus*, etc. (see these titles).

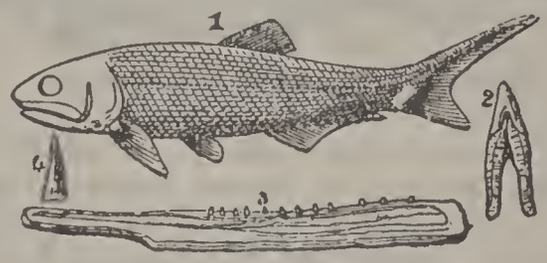
SAURIAN, n. *saw'rĭ-ăn* [Gr. *sauros*, a lizard]: one of the scaly reptiles of which the common lizard and the crocodile have been taken as therepresentatives: ADJ. of or pertaining to the saurians. SAU'RIANS, n. plu. *-ănz*, an order of fossil reptiles of gigantic forms: see SAURIA.

SAURIN, *sō-răng'*, JACQUES: famous French Prot. preacher: 1677, Jan. 6—1730, Dec. 30; b. Nîmes. He studied at Geneva, and was chosen minister of a Walloon church in London 1701. But the climate of England did not agree with his delicate health; and in 1705 he settled at the Hague, where his extraordinary gift of pulpit oratory was prodigiously admired; but his clerical brethren assailed him with the accusation of heresy. The ground of their charge was that S. had attributed falsehood to God. Commenting in a thesis on the conduct of Samuel (I Sam. xvi.) when about to proceed to Bethlehem to anoint David, S. had pointed out that God induced the prophet to adopt such measures and such language as could not but lead King Saul to believe what was not true. He argued, however, that, as the 'will of God' can never command what is criminal or wrong, this deception by Samuel was quite innocent. S.'s logic, like his exegesis, may not be pronounced faultless, but he deserves credit at least for not denying the existence of an ethical difficulty. The dispute was carried to the synod of Hague, whither S. went to defend himself, and where he died. As a preacher, S. has often been compared with Bossuet, whom he rivals

in force, if not in grace and subtlety of religious sentiment. His chief productions are: *Sermons sur divers Textes de l'Écriture Sainte* (La Haye 1708–25); *Nouveaux Sermons sur la Passion* (Rotterdam 1732); *Discours sur les Événements les plus mémorables du V. et du N. T.* (Amst. 1720–28); *Abrégé de la Théologie et de la Morale Chrétiennes en Forme de Catéchisme* (Amst. 1722); and *État du Christianisme en France* (La Haye 1725).

SAUROBATRACHIA, n. plu. *saw'rō-bă-trā'kĭ-ă* [Gr. *sauros*, a lizard; *batrachos*, a frog]: the order of the tailed Amphibians; the Urodela.

SAUROID, a. *saw'royd* [Gr. *sauros*, a lizard; *eidos*, likeness]: having some of the characteristics of the saurians. SAUROIDEI, n. plu. *saw-roy'dē-ī*, an order of fossil fishes, so called from their exhibiting certain sauroid or reptilian characters. SAUROID FISHES, fishes which approach in their structure to saurian reptiles. Of recent S. fishes, examples are Bony Pikes (q.v.) and Sturgeons (q.v.). —Fossil S. fishes are numerous, some of them of very large



Sauroids (fossil).

1, Pygopterus (restored). 2, Tooth of same (enlarged). 3, Jaw with teeth of *Belonostomus cunctus*. 4, Tooth of *B. cunctus* (enlarged).

size. The teeth of *Megalichthys* are nearly four inches in length, far exceeding those of any existing fish, and bony plates of the same fish have been found five inches in diameter.

SAUROPSIDA, *saw-rŏp'sĭ-da* [from the Gr., meaning lizard-like]: name introduced by Prof. Huxley to include reptiles and birds; the fishes and amphibians (batrachians) being correspondingly named by him *Ichthyopsida*. Reptiles and birds agree in many points of skeletal anatomy, and somewhat in dermal characteristics; the first known birds, found fossil in the Mesozoic, were reptilian in many features (see ARCHÆOPTERYX); and, singularly, monsters and winged fowl appear in the Scripture account as created in the same fifth day or period (Gen. i. 21).

SAUROPTERYGIA, n. *saw-rŏp'tĕr-ĭj'ĭ-ă* [Gr. *sauros*, a lizard; *pterux* or *pteruga*, a wing or fin]: flying reptiles; one of the 13 orders of the reptiles proposed by Prof. Owen.

SAURY PIKE, *saw'rĭ pīk* (*Scomberesox*): genus of fishes of order *Pharyngognathi* and family *Scomberesocidæ;* having the body greatly elongated, and covered with minute scales; the head also much elongated, and the jaws produced into a long sharp beak, as in the Garfish, from which, however, the genus Saury Pike differs in the division of the dorsal and anal fins in o finlets, as in mackerels. One European species (*S. saurus*) is about 15 inches long, the back dark-blue, the under parts white;

Saury Pike (*Scomberesix saurus*).

the fins dusky-brown. It approaches the coast, and enters inlets in shoals, pursued by larger fishes, porpoises, etc.; and to escape, the Saury Pike often leaps out of the water, or rushes along the surface, a hundred feet, scarcely seeming to touch the water: hence the name SKIPPER. A corresponding species on the e. United States coast is *S. Storeri.* It is one of the species called Billfishes. The flesh of the Saury Pike is palatable.

SAUSAGE, n. *saw'sāj* [F. *saucisse,* a sausage—from It. *salsiccia,* a sausage—from *salsa,* sauce, seasoning—from L. *salsus,* salted; *sal,* salt]: entrail or gut of an animal thoroughly cleaned, and stuffed with meat chopped very fine and highly seasoned. Usually, a considerable length of the intestine is filled, and divided into a link of separate sausages by constricting it with pieces of string at short intervals. The sausages of Lucania, favorite with the Romans, were of fresh pork and bacon chopped fine, with nuts of the stone-pine, and flavored with cumin-seed, pepper, bay-leaves, various pot-herbs, and the sauce called garum.

SAU'SAGE-POI'SON: a ptomain (botulin) appearing occasionally in sausages made or kept under certain unknown conditions. In Germany, where sausages are a common food, fatal cases of sausage-poisoning are not very rare. The symptoms are slow in appearing, three or four days sometimes elapsing before they manifest themselves. The poison is a narcotic-irritant. The chief symptoms are dilatation of the pupils, cough, dryness of the mouth and throat, drooping of the eyelids, and sometimes paralysis; the poison acts especially upon the nervous system.

SAUSSURE, *sō-sür'*, HORACE BENEDICT DE: Swiss physicist and geologist: 1740, Feb. 17—1799, Jan. 22; b. Conches, near Geneva. In 1762 young Saussure obtained the chair of physics and philosophy in the University of Geneva. He had rare powers as scientific explorer and observer; and 1768 he began the famous series of journeys in which he visited the Jura and Vosges Mountains, those of Germany, England, Italy, Switzerland, Sicily and adjacent isles; the extinct craters of Auvergne, etc.; and traversed the Alps 14 times by 8 different routes. He was the first 'traveler' who ever ascended the summit of Mont Blanc; he camped 17 days on the Col du Géant, and ascended Monte Rosa 1789. He took accurate note of the minerals, physical features, botany, and meteorology of the mountains; and put the science of geology for the first time on a basis of fact. His observations are given in *Voyages dans les Alpes,* etc. (Neufchatel, Geneva, Paris, 1779-96, 4 vols.)—a work admirable also for splendid descriptions of Alpine scenery. To the instruments then known, he added the cyanometer and diaphanometer, of his own invention. In 1786 Saussure resigned his chair; and 1798 was offered a chair of philosophy by the French government; but his bodily and mental health had begun to fail.—Saussure was a member of the Council of Two Hundred and of the national assembly. He died at Geneva. Among his many works, *Sur l'hygrometrie* (1783) is notable as setting forth his discovery of the dilatation in bulk, and diminution in specific gravity, of air charged with moisture. 'Description of the Alps,' a portion of his great work, was published separately 1834, at Geneva and Paris.

SAUSSURE'S HYGROMETER, n. *sō-sürz' hī-grŏm'ĕ-tėr:* the hair hygrometer. See HYGROMETER.

SAUSSURITE, n. *saws'sū-rīt* [after *Saussure,* Swiss naturalist]: impure variety of Labrador felspar, of bluish or greenish-gray color, forming the *jade* of the Swiss Alps. SAUSSU'REA, *-sū'rē-ă,* genus of herbaceous Alpine plants, ord. *Compositæ,* sub-ord. *Tubulifloræ;* the *S. alpīna* has a crowded tuft of rather large purple flowers, and is found on Snowdon, and in the Highlands of Scotland.

SAUTE, n. *sō-tā'* [F. *sauter;* L. *saltārĕ,* to leap, to jump—from *salĭō,* I leap]: in *cookery,* a process of frying with great nicety by tossing the materials in the pan. SAUTÉ-PAN, a shallow copper cooking-vessel resembling a frying-pan.

SAUTERELLE, n. *saw'tėr-ĕl* [F.]: a mason's implement, used in tracing and forming angles.

SAUTERNE, n. *sō-tėrn'* [F.]: a choice French wine.

SAUTRANTIKA: second of the four great schools or systems of Buddhism, the three others being called *Vaibhâshika, Madhyamika,* and *Yogâchâra.* They recognize the authority of the *Sûtras* (q.v.), but reject that of the Abhidharma. See C. F. Koeppen, *Die Religion des Buddha* (Berlin 1857).

SAVAGE, n. *săv'āj* [F. *sauvage;* OF. *salvage*—from mid. L. *salvat'ĭcus,* savage, wild—from L. *silvat'ĭcus,* living in the woods—from *silva,* a wood—*lit.,* one who lives in the woods]: an uncivilized human being; a fierce, merciless man; a barbarian: ADJ. wild; uncultivated; untamed; rude; unpolished; fierce; brutal. SAV'AGELY, ad. *-lĭ.* SAV'AGENESS, n. *-nĕs,* the state or quality of being savage; cruelty; wildness. SAV'AGERY, n. *-ă-jĕr-ĭ,* a wild, uncultivated condition; barbarism.—SYN. of 'savage, a.': barbarous; ferocious; murderous; inhuman; cruel; brutal; fierce; wild; untamed; uncultivated; unpolished; uncivilized; untaught; brutish; rude; pitiless; merciless; unmerciful.

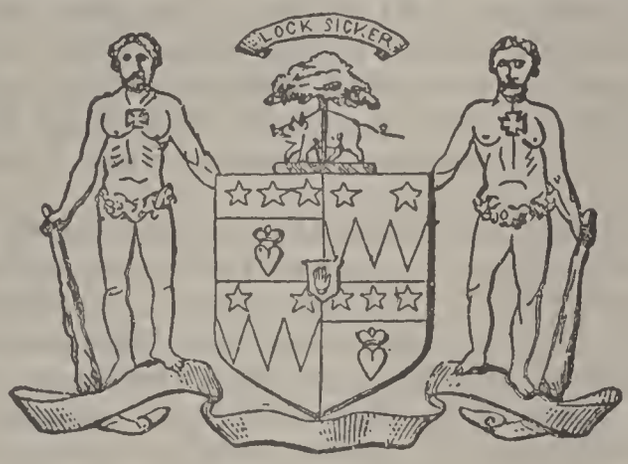
SAVAGE, *săv'āj,* MINOT JUDSON: clergyman: b. Norridgewock, Me., 1841, June 10. He fitted for college, but ill health compelled him to change his plan of study; graduated from the theological seminary at Bangor 1864, and the same year went to California as a Congregational home missionary, remaining there three years; was pastor of a church in Framingham, Mass., 1867-69, and at Hannibal, Mo., 1869-73. He left the Congregational for the Unitarian denomination; was settled in Chicago a year, pastor of the Church of the Unity in Boston 1874-91, and in the latter year became pastor of the Church of the Messiah in Chicago. In 1896 he took charge of the Church of the Messiah in New York. Among his books are: *Life Questions* (1879); *Poems* (1882); *Beliefs About the Bible* (1883); *The Religious Life* (1886); *My Creed* (1887); *Evolution of Christianity* (1892); *Is This a Good World* (1893); *Unitarian Gospel* (1897); *Life Beyond Death* (1901); *Poems* (1905).

SAVAGE, RICHARD: English poet, of mediocre talent but singular history: 1697, Jan.—1743, July 31; b. London. He was educated at the grammar school of St. Albans. His claim to be the son of the Countess of Macclesfield was believed by Dr. Johnson, who, after Savage's death, published in his *Lives of the Poets* Savage's account of himself and of his persecution by his alleged mother.

Savage's first successful literary work was his tragedy of *Sir Thomas Overbury.* In 1727 he killed a man in a drunken tavern brawl—for which he was tried, and sentenced to death; but was pardoned on the intercession of the Countess of Herford with the queen. His story of his birth becoming widely known, a strong feeling arose in his favor, and he was received into the household of Lord Tyrconnel, who allowed him £200 a year. His poem, *The Wanderer,* was now published; its success was great. But Savage's prosperity did not long continue. The inveterate irregularity of his habits involved him in difficulties with Lord Tyrconnel; they parted; and afterward he sunk irretrievably. A poem which he wrote to commemorate the queen's birthday so pleased her that she pensioned him with £50 a year. This it was his regular habit to dis-

sipate in a week's debauchery, passing the rest of his year in what disreputable fashion he could. A subscription was started for him, mainly through the influence of Pope; but happening to visit Bristol, where he lived in the reckless manner habitual to him, he was arrested for a debt of £8, and died in prison there. Such celebrity as still attends his name he owes almost entirely to the masterly life of him by Dr. Johnson, who, in the time of his own early struggles, was thrown much into his society.

SAV'AGES, or WILD MEN, in Heraldry: frequent as supporters; represented naked, and often wreathed about the



The Douglas Arms.

head and middle with laurel, and often furnished with a club.

SAV'AGE'S STA'TION, BATTLE of: see CHICKAHOMINY, BATTLES of.

SAVANNAH, *sa-văn'na:* city, port of entry, cap. of Chatham co., Ga.; on the Savannah river, and on the Georgia Central, the Charleston and Savannah, and the Savannah Florida and Western railroads; 18 m. above the mouth of the river, 115 m. s.w. of Charleston, 295 m. e.s.e. of Atlanta; 6 sq. m.; known as 'the forest city of the south.' The development of the railroad and steamship systems, and the improvements in the river undertaken by the federal govt. to enable ships of heavy draught to proceed from the ocean direct to the city wharves, have done much to advance the prosperity of the city since the close of the civil war. The harbor is safe, spacious, easy of access, and one of the best on the s. coast, and the river is now navigable for vessels of considerable draught as far as Augusta. The city occupies a sandy plain, 40 ft. above high water; is laid out with wide streets intersecting each other at right angles, the principal ones extending n. and s., and shaded with noble trees of many varieties: there are 26 public parks, including Forsyth Place (30 acres), in the centre of the city. The city is built mostly of brick. It is well drained; lighted with gas and electricity: supplied with excellent water, paid fire dept., and street railroads; and with its dressing of water-oaks, evergreens, ornamental trees, and shrubbery, and the long, floating over-drapery

of gray moss that depends from the branches of the trees, merits the name 'forest city.'

Next to New Orleans, Savannah is the most important commercial city in the South. It is the greatest cotton port on the Atlantic coast of the United States. It has a water frontage of 6 miles. The largest sea-going vessels load at the city wharves, and the river is navigable by steamers as far as Augusta. It has large exports of cotton, rice, lumber, fertilizers, tobacco and naval stores. For the year ending 1903, June, the value of merchandise imported was $1,037,366; exported $54,140,882. During the ten months ending June, 1903, the bales of cotton exported numbered 984,503; value $44,326,472. The tonnage of foreign vessels entered in 1903, June, was 15,105; of American vessels cleared 1,097; foreign 12,594.

In 1900 Savannah had 155 manufacturing establishments, employing a capital of $5,716,491 and 2,870 persons; paying $1,176,150 for wages and $3,915,884 for materials. The combined output for 1900 was $6,461,816. The number of industries and their products has largely increased since 1900. The industries include fertilizer plants, cottonseed-oil mills, iron foundries, saw-mills, planing mills, rice and flour mills, cotton mills, furniture, sash, door and blind, broom and varnish factories, machine shops, ice factories, printing offices, book-binderies, a lithographing establishment, breweries, etc. It has also daily and semi-weekly newspapers.

The city has a County Court-House, United States Post-office and Court-House, City-Hall, Custom-House, Arsenal of the First Battalion Heavy Artillery, Armory of the First Regiment of Infantry, Chamber of Commerce, Cotton Exchange, Board of Trade, Saint Joseph's Hospital, Episcopal Orphans' Home, Savannah Hospital, Telfair Hospital for Females, Masonic Temple, Theatre, Odd Fellows' Hall, Georgia Historical Society, Public Library, Telfair Academy of Arts and Sciences, and many large buildings of modern architecture. Ten miles from the city is the Bethesda Orphan House, founded by Rev. George Whitefield in 1740.

Prominent among the church buildings are Christ Church, Wesley Monumental Church, Trinity Methodist Church, First Baptist Church, Saint John's Church, Saint John's Roman Catholic Cathedral, Hebrew Synagogue Mickva Israel, and Independent Presbyterian Church. There are over 30 churches in the city, 13 of which are for colored congregations. The city also has the convent of Saint Vincent de Paul and an excellent public school system. There are 9,000 enrolled pupils in the public schools, which are maintained at an annual expense of $125,000. The streets are wide and beautifully shaded, and intersected with parks or squares at regular intervals. In Johnson, Monterey,

and Madison squares are monuments to Nathaniel Greene, Count Pulaski, and Sergeant Jasper, heroes of the Revolution. In Forsyth Place stands a monument to the Confederate dead. There is also a monument to Tomochichi, the Indian chief, and other public memorials. Bonaventure Cemetery (4 m. distant), Thunderbolt (5 m.), and Jasper Spring (2½ m.) are places of picturesque, social, and historical interest.—Savannah was settled by Gen. Oglethorpe 1733; unsuccessfully attacked by the British 1776; captured by them 1778; successfully defended against a combined American and French attempt to recapture it 1779; held by the British till the conclusion of peace; and made a city 1789. Pop. (1910) 65,064.

SAVAN'NAH RIVER: boundary between Georgia and South Carolina; rising in two small streams, the Tugaloo and Kiowee, near the s. line of North Carolina, which unite and flow s.s.e. to the Atlantic, 18 m. below Savannah; total length about 450 m.

SAVANNAH, n., or SAVANNA, n. *sa-văn'na* [Sp. *sabana,* a sheet, a large plain—from L. *sabănum;* Gr. *sabanon,* a towel]: great central plain of North America—a term used in the southern states (introduced by the early Spanish settlers) as *prairie* is in the northern and western, or as *llano* and *pampa* are in South America: any very large grassy plain or natural meadow. See PRAIRIE; PLAIN.

SAVANT, n. *să-vâng'* [F. *savant,* a savant—from *savoir,* to know—from L. *sapĕrĕ,* to be wise]: a man of learning. SAVANTS', n. plu. *-vângz',* the learned; the corresponding L. term is, the *literati.*

SAVARY, *sâ-vâ-rē',* ANNE JEAN MARIE RENÉ, Duc de Rovigo: French general and diplomatist: 1774, Apr. 26—1833, June 2; b. Marcq, in Ardennes. He entered the army as a volunteer 1790, and served with distinction in the army of the Rhine. In 1797 he accompanied Desaix to Egypt as *chef d'escadron,* and remained under his command. After the battle of Marengo (1800), Napoleon made him his aide-de-camp, and for several years employed him only in political affairs, for which he showed admirable capacity. In 1803 he was made general of brigade; 1804, as commandant of the troops stationed at Vincennes, he presided at the execution of the Duc d'Enghien, an event which he is believed to have unduly hastened; and in the Prusso-Russian Austrian wars 1806-08, he acquired high military reputation, his victory at Ostrolenka 1807, Feb. 16, being a brilliant achievement. Created Duke of Rovigo 1808, he was sent to Spain, and negotiated the perfidious arrangement by which the Spanish king and his son were kidnapped. In 1810 he replaced Fouché as minister of police. After the fall of Napoleon, to whom he had always been passionately and unscrupulously devoted, he wished to accompany him to St. Helena; but he was confined by the British government at Malta for seven

months, when he escaped to a ship, and was landed at Smyrna. After several vicissitudes, he returned to Paris 1818, and was reinstated in his titles and honors. In 1823 he removed to Rome; but at the close of 1831 he was appointed commander-in-chief of the French army in Africa, and during his brief administration of affairs in Algeria showed splendid energy and generalship. But ill health forced him to withdraw to France 1833, and he died at Paris. S.'s *Mémoires* (Par. 8 vols. 1828) are among the most curious and instructive documents relating to the period of the Empire.

SAVE, v. *sāv* [F. *sauver*—from mid. L. *salvārĕ*, to save, to protect—from L. *salvus*, safe]: to preserve from any evil, to rescue; to deliver; to bring out of danger; to preserve from everlasting misery; to hinder from being spent or lost; not to lose, as an opportunity; to prevent; to preserve or lay by; to spare; to be economical: PREP. except; not including. SA'VING, imp.. ADJ. frugal; not lavish; that secures everlasting salvation; incurring no loss; securing from loss or damage: N. something kept from being expended or used unnecessarily; that which is saved; in *OE.*, exception in favor: PREP. except; excepting. SAVED, pp *sāvd.* SAVER, n. *sā'vĕr*, one who saves. SA'VINGLY, ad. *-lĭ.* SA'VINGNESS, n. *-nĕs*, the quality of being saving; frugality. SA'VINGS, n. plu. *-vĭngz*, things kept from being wasted or lost; money laid by from time to time. SAVE-ALL, a small pan placed in a candlestick for burning out the ends of candles. TO SAVE APPEARANCES, to preserve a decent outside; to do something to avoid exposure or embarrassment. SAVE THE MARK! an exclamation indicating the desire that 'the impression, figure, or position attained may not be disfigured or displaced'—alluding to the ancient archery contests in which, when a competitor shot well, he exclaimed, 'God save the mark!'—that is, may it not be defaced or displaced by any following shot; a familiar exclamation implying wonder or deprecation.—SYN. of 'save, v.': to preserve; reserve; spare; excuse; reconcile; rescue; deliver; protect; prevent;—of 'saving, a.': frugal; economical, thrifty; parsimonious; sparing; penurious.

SAVE, *sâv:* river of s. Austria, important affluent of the Danube, formed by two streams, which rise in the extreme n.w. of Carniola, and unite at Radmannsdorf 1,560 ft. above sea-level. The river then flows s.e. through Carniola, passing Laibach (at which point it becomes navigable), and forming in part the boundary between Carniola and Styria; after which it traverses Croatia; and at its confluence with the Unna, first touches the Turkish dominions, whose n. boundary it forms throughout the remainder of its course to its junction with the Danube at Belgrade. Estimated length 500 m. Its principal affluents are the Laibach (200 m.), Kulpa, Unna, Bosna, and Drina.

SAVELOY, n. *săv'ĕ-loy* [F. *cervelas*, a kind of sausage —from *cervelle*, brains—from L. *cerebellum*, dim. of *cerebrum*, the brain]: kind of sausage sold ready cooked in the London shops; made of young *salted* pork, highly seasoned, and having a little saltpetre added to redden the color.

SAVIGLIANO, *sâ-vēl-yâ'nō:* fortified town of n. Italy, province of Cuneo, 9 m. e. of Saluzzo; on the Maira and the Grana. It is a clean and handsome town. Cloth and silk are extensively manufactured, and the country near is productive in wines and grain. Cattle are reared in great numbers, and silk-worms are bred largely. Pop. of town 17,300.

SAVIGNY, *sâ-vēn-yē'*, Friedrich Karl von: writer on Roman jurisprudence: 1779, Feb. 21—1861, Oct. 25; b. Frankfurt-on-the-Main; descended from a French Calvinistic family, that had emigrated to Germany 1622 to avoid religious persecution. He studied at Marburg, and took his degree 1800, after which he began a series of lectures on juridical subjects, attended by a numerous auditory. Struck, in his exposition of the Digest, with the divergence existing between the text and the commentaries on the theory of possession, he composed 1803 his masterly treatise, *Das Recht des Besitzes*, in which the Roman law is disengaged from the extraneous elements introduced into it by Germanic law, common usage, and the misapprehensions of commentators. Its merit was quickly recognized, and S. received advantageous offers from different universities, which, however, he declined, in order to prosecute researches in the libraries of France and Germany, with a view to a historical development of the glosses of commentators. He was assisted in this laborious undertaking by his pupil, Jakob Grimm, and by his own young wife, daughter of the poet Clem. Brentano, and Bettina von Arnim. Appointed prof. of law at Landshut 1808, he was called, two years afterward, to Berlin, on the reorganization of the univ., and there he lectured with unbroken success 32 years, also filling important offices in the univ. and the state. He died at Berlin.—S. is the virtual founder of the new historical school of writers on jurisprudence, though it is fair to admit that Hugo and Schlosser had preceded him in the same direction. The essential idea of this school is, that 'law' or 'right' is not an abstract and absolute rule, manifesting itself under the same forms in all countries; but that it is one of the forces of society, with which it changes, according to fixed laws of development that are beyond the caprices of the day. This idea, worked out historically, has produced most important and original results, and may even be said to have reconstituted the science of jurisprudence. S.'s principal writings are: *Vom Berufe unserer Zeit für Gesetzgebung und Rechtswissenschaft* (Heidelb. 1815); *Geschichte des Römischen Rechts im Mittelalter* (6 vols. Heidelb. 1826–31); *System des heutigen Römischen Rechts* (8 vols. Berl. 1840–48); *Das Obligationenrecht* (1851–53); and *Vermischte Schriften* (5 vols. Berl. 1850), essays which had appeared in the *Zeitschrift für Historische Recht*—*senschaft*, and elsewhere.

SAV'ILE, George. See Halifax, Marquis of.

SAVIN, n., or Savine, n. *săv'ĭn* [F. *sabine;* It. *savina;* L. *Sabīna herba,* savin—*lit.,* the Sabine herb], (*Juniperus Sabina,* see Juniper): low, much-branched, and very widely spreading shrub, with very small, imbricated, evergreen leaves, on mountains in s. Europe and the East. It bears small black berries, covered with a pale blue bloom. Its foliage has a strong, fetid, aromatic, penetrating odor, particularly when rubbed. Its exhalations cause headache. The part of the plant used in medicine is the tops of the branches, collected in spring, and dried. Their odor is strong, peculiar, and unpleasant, and their taste acrid, bitter, resinous, and disagreeable. The therapeutic properties of savin are due to its volatile oil. Two pounds of the tops yield about five ounces of this oil, limpid and nearly colorless, having the odor of the plant, and a hot acrid taste. Its composition is $C_{10}H_{16}$, being isomeric with oil of turpentine. Savin exerts a stimulating effect on the uterine organs, and is employed in cases of amenorrhœa and chlorosis, depending on want of tone in those parts. It is best given in the form of the oil; but is a dangerous remedy, and to be used only under professional advice. If a poisonous dose has been taken, emetics should first be employed to remove any of the drug that may remain in the stomach, after which opiates and demulcents should be prescribed. Savin in the form of ointment is applied externally to prolong the discharge from a blistered surface: if long kept it loses its preperties.

The American savin, or red cedar (*J. Virginiana*), differs from our common juniper (*J. communis*) in having pointless leaves without distinct midrib, not articulated to the stem, and varying from awl-shape to overlapping flat; and it differs from our *J. Sabina,* variety *Procumbens,* in not creeping, and in having smaller, erect fruit. It is common on barren soil as a shrub or small tree, but westward attains sometimes 60-90 feet.

SAVINGS BANKS: in their inception, were primarily benevolent institutions, organized for the benefit of the working, thrifty citizen, who desirous of safeguarding the future of himself, and of those dependent upon him, saved small sums from his daily or weekly earnings; commercial and financial banks could not and would not attend to these small accounts, and therefore the lawmakers, urged by public-spirited citizens, incorporated institutions, wherein the savings of the frugal-minded, industrious and thrifty, whose savings were too small to invest in public securities, or whose ignorance of business prevented a more profitable use of their capital.

Savings banks are of comparatively modern origin, and it is only towards the end of the 18th c. that we find any mention of them. Small beginnings were made in 1778 in Hamburg, Germany, and 1787 in Berne, Switzerland; these associations, however, simply cared for the spare cash of servants, mechanics, and laborers, and as a

rule did not allow withdrawals, but granted annuities; being different from the English idea of savings banks. In England the matter was suggested, it is said, by Jeremy Bentham, in 1797, in his system of frugality banks, but the first known attempt in that direction was made in 1798 by the Rev. Joseph Smith of Wendover, who offered his parishioners to take care of their savings during the summer months and to repay them at Christmas with a bounty of one-third additional; about the same time the 'Friendly Society for the Benefit of Women and Children' was established at Tottenham High Cross, by Mrs. Priscilla Wakefield, and this society became regularly organized in 1804; Malthus also suggested, in 1803, the idea of county banks for the laboring classes. The first regular organization brought before the public was in 1810, when the Rev. Henry Dunkin of Ruthwell, Dumfrieshire, Scotland, started a self-sustaining institution, receiving deposits from the general public; during the first year of this 'Parish Bank' the receipts amounted to £151, and in four years increased to £922. In 1814 the Edinburgh Savings Bank was established on the basis of Mr. Dunkin's plan. In London the first savings bank was opened in 1816 and was recognized by Act of Parliament in 1817.

Generally speaking, it may be said that because of the fact that the paternal governments of Europe have large functions, thereby exerting a powerful influence in the economic life of the nation, and also partly owing to the lack of initiative in private benevolent enterprises, savings banks were started there as national enterprises, usually managed through some public authority.

In the United States the functions of the government are more limited, and are usually restricted to formulating general legislation, or granting charters to savings institutions under the laws of the different states, and also exerting some supervision over them, by means of periodical examinations by the state bank superintendent or commissioner. Under our system of government we are apt to consider that our citizens are fully able to attend themselves to their banking business, in the same manner as the banks of deposit and discount, and it is a good American practice, that does not allow the state to interfere with the private business of its citizens, and restricts it to its own functions, as well defined in the constitution. In the United States there is no permanent or perpetual debt, thus making this form of investment impracticable, as it certainly would be injudicious for our savings banks, who are usually looked upon as local institutions, the money which they receive on deposit being loaned out, whenever practicable, in the vicinity of the bank itself. We may trace the first savings bank in the United States to the organization in 1816 of the Philadelphia Savings Fund Society, in Philadelphia, Pa., a private association which was afterwards incorporated

by the legislature of Pennsylvania in 1819. The Provident Institution for Savings in the town of Boston, Mass., was incorporated in 1816, and the Savings Bank of Baltimore, Md., in 1818. In New York the first organized savings bank was the Bank for Savings. Efforts had been made for several years by public-spirited citizens of that city, to get a charter from the legislature for such bank, acting on a suggestion received from Patrick Colquhoun, a magistrate in London, by his correspondent in New York, Thomas Eddy; but the then existing hostility to banks rendered this very difficult, and it was not without much work and considerable delay that at last, in 1819, a bill incorporating the Bank for Savings was passed by the legislature and approved by the council of revision.

The primary savings bank being wholly philanthropic, the services of the trustees are usually gratuitous, and on this basis there have been built, in the eastern states of the United States, a large number of flourishing institutions, answering perfectly to the demands that gave them birth. Criticisms have been made at times, and were echoed in the legislature, disapproving of the requirement of the gratuity of the trustee's services, and arguing that men are sure to become careless in their supervision when not paid for their services; partly because of this contention, the plan of mutual savings banks has not been adopted in the western and southern states, where the savings bank business is done by financial institutions furnishing their capital and surplus as a guarantee for the repayment of deposits, and where the directors and stockholders are directly and financially interested in the success of the bank. Another reason to be considered also, was that conditions in these states differ vastly from those existing in the eastern states. It was generally believed that purely mutual savings banks would not receive sufficient support, and could not succeed in the more sparsely settled parts of our country, and therefore they were instituted as adjuncts, or departments, of regular commercial banks of deposit. A few large and successful mutual savings banks, based on the eastern idea, and flourishing in the western and far western states, seem, however, to prove that this reason does not always apply. There is no doubt that mutual savings institutions, protected by wise legislation, strictly restricted as to first-class investments and practically freed from taxation, are as safe depositaries of the savings of the nation as may well be devised; and no institutions created with that object in view can possibly be made too safe. A proposal for postal savings banks has been frequently before the public, but has never met with success. The main arguments against them consist in the difficulty which would be found in investing these large amounts by a body of constantly changing officeholders, and also that the functions of the state should not be increased, but rather diminished.

SAVINGS BANKS.

The average rate of interest paid to savings bank depositors in the United States is about 3½ per cent per annum.

In England the savings banks are both governmental and trustee banks. The trustee banks are based on a plan somewhat similar to our mutual banks in the United States. The governmental banks are called postal savings banks. Deposits and withdrawals are made through the numerous post-offices in Great Britain, and the deposits, as is mainly the case with trustee banks, are invested in government securities through the commissioners of the public debt. These post-office savings banks have about 8,800,000 depositors, with aggregate deposits of about $700,000,000. The interest paid is about 2¾ per cent per annum.

The following table shows the number of depositors and amount of deposits in savings banks in the different countries of the world, where statistics are obtainable:

Countries—	Number of Depositors.	Total Deposits.
Austria-Hungary	6,663,822	$ 1,309,752,448
British Colonies	2,782,572	330,858,520
Belgium	2,088,448	141,851,419
Denmark	1,203,120	236,170,057
France	11,298,474	847,224,910
Germany	15,432,211	2,273,406,226
Great Britain	11,093,469	966,854,253
Holland	1,330,275	72,738,817
Italy	6,740,138	482,263,472
Japan	7,467,452	40,887,186
Norway	718,823	89,633,481
Roumania	145,507	7,426,031
Russia	5,177,501	466,159,229
Sweden	1,892,586	151,480,442
Switzerland	1,300,000	193,000,000
United States	8,705,848	3,660,553,945
Total	84,040,246	$11,270,240,436

The above figures show average deposits in the savings banks in the world of $134.10 for each depositor. The United States statistics for 1908 show 1,453 savings banks, with 8,305,848 depositors, and deposits amounting to $3,660,553,945, an average of $420.47 for each depositor, and $41.84 per capita for an estimated population of 87,496,000.

The following table shows the growth of the savings banks in the United States:

Year—	Number of Banks.	Number of Depositors.	Deposits.
1820	10	8,635	$ 1,138,576
1825	15	16,931	2,537,082
1830	36	38,035	6,973,304
1835	52	60,058	10,613,726
1840	61	78,701	14,051,520
1845	70	145,206	24,506,677
1850	108	251,354	43,431,130
1855	215	431,602	84,290,076

Year.	Number of banks.	Number of depositors.	Deposits.
1860	278	693,870	$ 149,277,504
1865	317	980,844	242,619,382
1870	517	1,630,846	549,874,358
1875	771	2,359,864	924,037,304
1880	629	2,335,582	819,106,973
1885	646	3,071,495	1,095,172,147
1890	921	4,258,893	1,524,844,506
1895	1,017	4,875,519	1,810,597,023
1896	988	5,065,494	1,907,156,277
1897	980	5,201,132	1,939,376,035
1898	979	5,385,746	2,065,631,298
1899	987	5,687,818	2,230,366,954
1900	1,002	6,107,083	2,449,547,885
1901	1,007	6,358,723	2,597,094,580
1902	1,036	6,666,672	2,750,177,290
1903	1,078	7,035,228	2,935,204,845
1904	1,157	7,305,443	3,060,178,611
1905	1,237	7,696,229	3,261,236,119
1906	1,319	8,027,192	3,482,137,198
1907	1,415	8,588,811	3,690,078,945
1908	1,453	8,705,848	3,660,553,945

In several states of the Union associations of savings banks have been formed for mutual benefit, and for the purpose of watching over proposed legislation in regard to savings banks so as to protect the interests of their depositors. In 1901 a national union of savings banks was organized as the savings bank section of the American Bankers' Association. This section includes in its membership a majority of the savings banks in the United States, and conventions are held yearly where members from all parts of the United States meet to discuss the many subjects of particular interest to savings banks and to their depositors.

SAVIOR, or SAVIOUR, n. *sāv'yėr* [F. *sauveur*—from mid. L. *salvatorem*, a savior—from L. *salvus*, safe: Sp. *salvador;* It. *salvadore*, a deliverer]: one who saves; deliverer, redeemer. THE SAVIOUR (or SAVIOR), title of Jesus Christ or of God, as He who delivers man from the dominion of sin, and redeems man from the penalty of sin.

SAVO'NA: maritime city of n. Italy, province of Genoa, 25 m. s.w. of the city of Genoa. It is on a plain near the sea and has numerous manufactures, including extensive potteries. The neighborhood produces olives, fruits, grain, wood, and wines. There is brisk trade with Marseille. The harbor, one of the safest in the Mediterranean, was 25 to 30 feet deep, till the Genoese in the 16th c. filled it with stones; but since the opening of the Mont Cenis tunnel steps have been taken to clear it. The city is the third in importance on the Riviera. It is a very ancient city, and in the time of the Romans was called Sava, founded, according to tradition, by Janus. It flourished under the Roman empire, was destroyed by Rotharis (639), rebuilt by Ludovic the Pious (981), and afterward laid waste by the Saracens. Pop. about 30,000.

SAVONAROLA, *sâ-vo-nâ-rō'lâ,* GIROLAMO: celebrated preacher and political as well as religious reformer of Florence: 1452, Sep. 21 — 1498, May 23; b. Ferrara, of noble family. He was educated at home, and, at a very early age, became deeply versed both in the philosophy of the schools and in the old Greek philosophy, which at that time had become popular in Italy; but his disposition from the first was strongly tinged with religious asceticism, and 1474, under an almost fierce conviction of the world's intolerable wickedness, he formally withdrew from secular affairs, and entered the Dominican order at Bologna. Having with the severest austerities completed his novitiate and the studies of the order, he seems to have made his first public appearance as a preacher 1482, at Florence, where he had entered the famous convent of his order, San Marco, and where he preached the Lent in that year. His first trial, however, was a signal failure. His voice was harsh and unmusical, and he so utterly failed to interest his hearers that, after a time, the course of lectures was entirely deserted. Some time afterward, S. was sent to a convent of his order at Brescia, where, by degrees, his earnestness and zeal began to attract notice, and eventually the disadvantages of manner and address, which had preveted the effect of his early efforts, either were overcome through practice, or ceased to be felt under the influence of his sterling genius and irresistible enthusiasm. In 1489 he was recalled to the convent of San Marco at Florence. His second appearance in the pulpit of San Marco was a complete success. The great subject of his declamation was the sinfulness and apostasy of the time; and in his denunciation of the vices and crimes of his age, he took as his theme what has been the topic of enthusiasts in almost every age, the mystical visions of the Apocalypse, which he applied with terrible directness to the actual evils with which, as with a moral deluge, the age was inundated; and in these half-expositions, half-prophetical outpourings, his followers claimed for him the character of an inspired prophet. Under the rule of the great founder of the family of the Medici, Lorenzo the Magnificent, art, literature, and philosophy all had followed the common direction of that elegant but semi-pagan revival which the scholars of the 15th c. had inaugurated; and the whole spirit of the social as well as intellectual movement of which Florence, under the Medici, was the centre, was utterly at variance with the lofty Christian spirituality and severe asceticism in which S. placed the very first conditions of the restoration of true religion and morality. His preaching, therefore, in its spirit, as well as in its direct allusions, was no less antagonistic to the established system of the government, than to the worldly and irreligious manners of the age; the visions and predictions ascribed to him had quite as much of political applicability as of religious significance: thus, to the aristocratic adherents of the Medici, S. early became an object of suspicion, if not of antipathy and dread. It is said by Pico de Mirandola that S. refused to grant absolution to Lorenzo, when

the latter lay dying 1492; but the statement does not accord with Poliziano's account of his patron's death. Through all this time, however, S.'s relations with the church were, if not of harmony, at least not of antagonism; and when, 1493, a reform of the Dominican order in Tuscany was proposed under his auspices, it was approved by the pope, and S. was named the first general vicar. About this time, however, his preaching had assumed a directly political character, and the predictions and denunciations which formed the staple of many of his discourses pointed plainly to a political revolution in Florence and in Italy, as the divinely ordained means for regeneration of religion and morality. In one of his discourses, he pointed plainly to the advent of the French under Charles VIII.; and when this prediction was fulfilled by the triumphant appearance of the French expedition, S. was one of a deputation of Florentines to welcome Charles VIII. as savior of Italy and to invite him to Florence. Very soon, however, the French were compelled to leave Florence, and a republic was established, of which S. became, though without political functions, the guiding and animating spirit, his party, popularly called *Piagnoni*, or 'Weepers,' from the penitential character which they professed, being completely in the ascendant. He was actually the lawgiver and the dictator of Florence. During this brief tenure of influence, S. displayed to the fullest extent both the extraordinary powers of his genius, and the full extravagance of the theories to which his enthusiastic asceticism impelled him. The republic of Florence was to be the model of a Christian commonwealth, of which God Himself was the chief ruler, and His Gospel the sovereign law; thus the most stringent enactments were made for repression of vice, and of all the sinful follies by which it is fomented. All the haunts of debauchery were suppressed; gambling in all its forms was prohibited; the vanities of dress were restrained by sumptuary enactments; and, under the impulse of the popular enthusiasm which the enthusiasm of the prophet engendered, women flocked in troops to the public square to fling down their costliest ornaments, and gay gallants and grave scholars destroyed, in one common *auto-da-fe* before the gates of the cathedral, whole hecatombs of the amatory poetry or licentious fiction of the day, in conjunction with the elegant paganism or unconcealed immorality of the classic period. Meanwhile, the extremes of his rigorism; the violence of his denunciations, which did not spare even the pope himself; the assumption by him, or attribution to him, of a supernatural gift of prophecy; and the extravagant interpretation of the Scripture, and especially of the Apocalypse, by which he sought to maintain his views, drew upon him the displeasure of Rome. He was cited 1495 to answer a charge of heresy at Rome; and on his failing to appear, he was forbidden to preach; the brief by which the Florentine branch of his order had been made independent was revoked; and he was again summoned to Rome. Once again S. disregarded this order. But his difficulties in

Florence now began to deepen. The measures of the new republic proved impracticable. The party of the Medici, called 'Arrabbiati' (Enraged), began to recover ground. A conspiracy for the recall of the exiled house was formed; and though, for the time, it failed of success, and six of the conspirators were condemned and put to death, yet this very rigor hastened the reaction, for this execution was a direct violation of one of S.'s own laws, and it tended to direct the popular sympathy in favor of the conspirators. At the critical point of the struggle of parties (1497) came a sentence of excommunication from Rome against S. He openly declared the censure invalid, because unjust, and refused to hold himself bound by it. In the following year, however, when the new elections took place, the party opposed to S., the Arrabbiati, came into power. He was ordered to desist from preaching; and the struggle was brought to a crisis by the counter-denunciations of Francesco da Puglia, a preacher of the Franciscan order, long an antagonist of S. In the excited state of the popular mind thus produced, an appeal was made by both the contending parties to the interposition of divine providence by the ordeal of fire. But at the moment when the trial was to have been made, difficulties were originated, which were falsely charged to the party of S., and nothing was actually done: the result was to destroy, with the populace, the prestige of S.'s reputation, and to produce a complete revulsion of public feeling. In the midst of this reaction, he was cited before the council, and brought to trial for misleading the people by false prophecies. He denied the charge; but under agonizing and repeated torture, he is said to have made a confession, which, however, his friends say was garbled, if not utterly falsified. Though he promised under torture to recant his errors, he reasserted his innocence when the torture ceased. He was declared guilty of heresy and of seditious teaching. The acts of the trial were sent to Rome, where the sentence was confirmed; and he, with two others of his order, was given up to the secular power. An effort was made to procure a remission of the capital sentence which was passed on them, but in vain; so 1498, May 23, this extraordinary man, and his two companions, F. Domenico da Pescia and Silvestro Maruffi, were strangled, and their bodies burned by the executioner. They died professing their adherence to the Rom. Cath. Church, and humbly accepting the last absolution from the papal commissary; and it is still a question among Rom. Catholics, whether S. is to be regarded in the light of a confessor of the truth, or of a fanatical forerunner of the movement which so soon reached its development in the Reformation.—The works of S. are very numerous. They were written either in Latin or in Italian, but have for the most part been translated into French, German, Spanish, and other languages. His works in Latin are: (1) *On the Simplicity of the Human Soul;* (2) *The Triumph of the Cross;* (3) *A Dialogue of the Spirit and the Soul;* (4) *A Fourfold Exposition of the Lord's Prayer;* (5) *On the Perfection of*

the Spiritual Life. Most of them were translated contemporaneously into Italian, and some even by S. himself His principal Italian works are: *A Treatise on Humility, On the Love of Jesus Christ, On the State of Widowhood, Two Treatises on Prayer, Rules of Christian Living* (together with a work of a title almost the same, which he wrote while in prison, and at the desire of his jailer), *On the Mysteries of the Mass*, and several other doctrinal and ascetical treatises. No collected edition of his sermons has been published, and his correspondence also has mostly disappeared; but the works which survive sufficiently illustrate the peculiarities of his genius, and the stern and fierce enthusiasm which was the secret of his influence on that corrupted though cultivated age.—See Madden's *Life of Savonarola* (2 vols. 8vo 1854); Abbé Carle's *Histoire de S.* (Paris 1842); and especially Villari's *Storia di S.* (Flor 1859–61). See also Mrs. Oliphant's *Makers of Florence* (1877).

SAVONNETTE, n. *săv-ŏn-nĕt'* [F., a wash-ball; *savon*—from L. *sapo* or *sapōnem*, soap]: hard ball (or other form) for the toilet, principally composed of soap, rose-water, sweet-oil, oil of almonds, spermaceti, and camphor.

SAVOR, n. *sā'vĕr* [F. *saveur*, savor, relish; Sp. *sabor;* It. *sapore*—from L. *sapor* or *sapōrem*, taste—from *sapĕrĕ*, to taste]: taste; flavor; relish; smell; that quality which renders anything valuable or agreeable; reputation: V. to have a particular taste or smell; to like the taste or smell of; to smack; to have the appearance of; to betoken; in *OE.*, to taste intellectually; to perceive. SA'VORING, imp. SA'VORED, pp. *-vĕrd.* SA'VORLESS, a. *-lĕs*, destitute of smell or taste. SA'VORY, a. *-ĭ*, pleasing to the taste or smell; relishing. SA'VORILY, ad. *-lĭ.* SA'VORINESS, n. *-nĕs*, the quality or condition of being savory.—SYN. of 'savor, n.': taste; flavor; relish; odor; scent; smell.

SAVORY, n. *sā'vŏr-ĭ* [F. *savorée;* It. *santoreggia;* L. *satureia*, savory], (*Satureia*): genus of plants of nat. order *Labiatæ*, nearly allied to Thyme (*Thymus*), and differing from it in the regularly 5-toothed or 5-cleft calyx, and the stamens bent together into an arch under the upper lip of the corolla. The species are herbaceous and half-shrubby plants, all natives of s. Europe and the East. They have narrow, linear-lanceolate, entire leaves, with resinous dots, and short, axillary, little corymbs. The COMMON S., or SUMMER S. (*S. hortensis*), is cultivated in kitchen-gardens for flavoring dishes. It is an annual 6 to 12 inches high, with leaves not prickly pointed, and lilac or white flowers; has a strong and agreeable aromatic smell, and an aromatic pungent taste, and is in common use both fresh and dried for flavoring dishes. It is stomachic and tonic.—WINTER S. (*S. montana*) is used in the same way. It is a half-shrubby plant, with prickly-pointed leaves and larger flowers. Its taste is pungently aromatic. —Summer S. is propagated by seed; Winter S. by slips and cuttings.

SAVOY, n. *sa-voy'* [so called because originally from *Savoy,* in France: Ger. *savoyerkohl,* savoy-cabbage]: cultivated variety of CABBAGE (q.v.), forming a large, close head like the true cabbages, but having wrinkled leaves.

SAVOY', HOUSE OF: ancient family of n.w. Italy. The small territory of Savoy formed a part of ancient Gaul, and, after the decline of the Roman power, was seized by the Burgundians (407), and with Burgundy passed under the Franks (534). On the breaking up of the Frankish empire, Savoy was joined to *Transjurane Burgundy,* and with that kingdom was united to *Cisjurane Burgundy,* or Arles. On the accession of the last king of Arles to the imperial throne as Conrad II., the great lords of n.w. Italy, such as the lords of Suza, Chablais, Maurienne, and Turin, became vassals direct of the empire. The counts of Maurienne, ancestors of the House of Savoy, are generally believed by most historians who have investigated their genealogy to have descended directly in the male line from a son of Wittekind the Great, the last independent king of the Saxons; and COUNT HUMBERT, *the White-handed,* was the first of the family who, by the addition of Chablais and Valais (grants from Emperor Conrad the Salic) to his hereditary lordship of Maurienne, rose to high position among the princes of n. Italy.—One of his descendants, HUMBERT II. (ruled 1078-1103), succeeded to the marquisate of Suza (which included the greater part of Piedmont), and further increased his little territory by the conquest of Tarantasia. The family now began to form alliances with the royal houses of France, Portugal, England, Naples, Spain, and Germany, which added greatly to its political importance. —AMADEUS III. (ruled 1103-1149) received from Emperor Henry V. the title COUNT OF SAVOY (1111), and his grandson, THOMAS I. (ruled 1188-1233), obtained important accessions in Chambéry, Turin, the country of Vaud, and many other lordships. Count Thomas was the initiator of the policy so long and successfully adopted by his successors, 'of preserving armed neutrality in all contests between France and the Empire, and of vigorously supporting the Empire against the papacy.' From this time the counts of Savoy became the arbiters of all quarrels in north, and occasionally in south Italy, and their bravery in the field, and keen political sagacity, increased at once their political influence and their territorial jurisdiction. This family has produced more great warriors and politicians than almost any other royal house of Europe. The male line of the elder branch of the house came to an end with Charles Felix 1831.—After the death of Count Boniface 1263, without heirs, his uncle PIETRO, Earl of Richmond and Lord of Essex, usurped the crown; but 1285 the rightful heir, AMADEUS V. (ruled 1285-1323), grandson of Pietro's elder brother, obtained the succession; and his grant to his brother

THOMAS of the principality of Piedmont as a hereditary fief, founded the two lines of Savoy and Piedmont, which continued to rule over their respective territories till, on the latter becoming extinct 1418, Piedmont reverted to the elder line. (See AMADEUS V., VI., and VIII.)—Amadeus VIII. was the first DUKE OF SAVOY, being so created by Emperor Sigismond 1416.—CHARLES I. (ruled 1482–89) obtained from Charlotte of Lusignan, Queen of Cyprus, the transference of her rights, and from this date (1485) the dukes of Savoy claimed to be also kings of Cyprus and Jerusalem.—The elder male line becoming extinct 1496, the next collateral heirs were PHILIBERT II. (ruled 1496–1504) and CHARLES III. (ruled 1504–53); but the latter, having sided with Charles V. against Francis I. of France, was deprived of the duchy of Savoy 1533, the countries of Valais and Geneva placed themselves under the protection of Switzerland, and 1536 the country of Vaud was seized by the people of Bern.—But his son, PHILIBERT EMMANUEL, Spanish gov. in the Netherlands, succeeded, at the peace of Cateau-Cambresis (1559), in obtaining repossession of Savoy. It was this duke who attempted to convert the Vaudois (q.v.), and who founded the now important silk-production in Piedmont, besides encouraging other industries. He reannexed (1576) the principality of Oneille, and conquered the county of Tende.—His successor, CHARLES EMMANUEL I. (ruled 1580–1630), was renowned as scholar, statesman, and warrior, but he was cursed with an inordinate ambition, which involved him in unfortunate contests with Geneva (a former town of Savoy, of which he wished to regain possession), with the French, who in revenge took possession of his dominions, and with the Spaniards.—His two sons, VICTOR AMADEUS I. (q.v.) (ruled 1630–37) and Thomas, were the respective founders of the two lines of Savoy and Savoy-Carignan. Victor Amadeus speedily regained the dominions which his father had lost; and with consent of France, added to them Montferrat, Alba, and some other places, relinquishing Pignerol, La Perouse, Angrone, and Lucerne to the French. As generalissimo of the French army in Italy, he gained two victories over the Spaniards.—His grandson, VICTOR AMADEUS II. (ruled 1675–1730), was one of the claimants for the Spanish throne on the extinction of the Spanish-Hapsburg dynasty (see SUCCESSION, WAR OF THE SPANISH); and by his adroit policy in the contest between the Hapsburgs and Bourbons for possession of this crown, he obtained extensive additions to his little territory, the chief being Alessandria, Val-di-Sesia, and other portions of the Milanese, the island of Sicily 1713, and with this latter the title king. He and his descendants were recognized also as the legitimate heirs of the Spanish throne, should the Bourbon dynasty ever become extinct. But 1720 he was compelled to surrender Sicily to Austria, in exchange for the island of Sardinia, which, with Savoy, Piedmont, and his other continental possessions, was then erected into the KINGDOM OF SARDINIA (q.v.).

SAVOY, *sa-voy'* (F. SAVOIE, *sâ-vwâ'*): formerly a duchy belonging to the kingdom of Sardinia (q.v.), now incorporated with France; bounded n. and e. by Switzerland, e. and s. by Piedmont, and w. by the French depts. Isère and Ain. While an Italian duchy, it was politically divided into seven provinces, which exhibited the successive steps of its acquisition by the House of Savoy; but since its annexation to France, this division has been modified, though the change has been little more than nominal. It is now separated into two depts.: first, SAVOIE, or CHAMBÉRY, the s. part of S., 2,388 sq. m.; pop. (1901) 254,781, divided into four arrondissements—Chambéry (old province of *Chambéry*), Albertville (*Alta-Savoia*), Moutiers (*Tarantasia*), and St. Jean de Maurienne (*Maurienne*)—cap., Chambéry: secondly, HAUTE-SAVOIE or CONFLANS, the n. part of S., 1,774 sq. m.; pop. (1901) 263,803; divided into four arrondissements—Bonneville (*Fossigni* or *Faucigny*), Thonon (*Ciablese* or *Chablais*), Annecy and St. Julien (*Genevese*)—cap., Annecy. The two depts. resemble each other so much in all respects that they may be described together.

S. is the most elevated tract in Europe, and is mostly covered with mountains, which break up the country into valleys, each watered by its own snow-fed torrent or stream. The highest elevation of S. is the summit of Mont Blanc (q.v.), and the lowest is the bank of the Rhone at Saint-Genix d'Aosta, 670 ft. above sea-level. The Graian Alps rise along the e. boundary of S., and form a natural barrier between it and Piedmont, several breaks or gorges affording means of communication between the two countries; from this range, the mountains gradually decrease in height toward the valley of the Rhone, which is on the w. boundary.

S. (especially Haute-Savoie) is extremely picturesque, and within a comparatively limited space exhibits at once the curious, the beautiful, the grand, and the wild and forbidding phases of natural scenery. There are the lakes of Geneva, Annecy (9 m. by 1½), Aiguebellette, each perfect in its own style of beauty; the subterranean lakes of Bauge, the cascades of Sallanches and Bout-du-monde, the intermittent springs of Pigros and Haute-Combe, the grottoes of Balme, Bauge, and Sallanches, the hot springs of Aix-les-Bains (near Chambéry), of St. Gervais, Bride, Echaillon, and others; the smiling valleys of Chambéry, Faverge, Maglan, and Albertville; the glaciers of Chamouni, Buet, and Upper Tarantasia; the wooded mountain-sides of Ciablese, the bare, rugged peaks which surround Mont Blanc, the frowning gorge of Challes, and the wild and savage glens and dells of Maurienne. Tourists consequently flock in great numbers to S., the robust to gratify their love of sight-seeing, and the invalids to benefit by the thermal springs, which are much esteemed.

The whole of the country is drained by streams which flow either into Lake Leman (the n. boundary) or the Rhone. Chief of the former is the Drance, which traverses Chablais; among the latter are the Arve, which drains

the Chamouni valley, the Usses, the Fier, the Laisse, the Guier, and the Isère. The geology of S. is marked by the presence of three distinct ranges, exhibiting respectively the primary, transition, and secondary series of rocks with great completeness; and the depth of the crevasses, the height of the mountains, inversions of strata, débris on the mountain-sides, afford excellent opportunities for study of the constitution and elements of the earth's crust.

The whole of S. is broken up into a multitude of small estates, and the country is, as a consequence, carefully cultivated, some of the fertile valleys resembling a continuous garden abounding in flowers and fruits. The ground suitable for cultivation being very limited, the enterprising natives have made extraordinary efforts to increase it by constructing line above line of parapets along the steep mountain-sides, and by filling in earth behind, forming long and narrow terraces, on which if they can succeed in growing two rows of vines, they consider themselves well rewarded for their labor. These terraces are most common in the hilly districts of Tarantasia and Maurienne.

The climate of S. is in general cold, the winters are long and severe, and the summers frequently follow without an intermediate spring. Yet S. has the vegetation of warm countries, as well as that of higher latitudes; the vine if found growing almost to the edges of the glaciers, and cereals and fruits of various sorts are produced in great perfection. The pasturage is rich and abundant, and mulberry-trees are largely planted. Although it is essentially an agricultural country, the industrial arts are represented; fabrics of cotton, printed calico and gauze, stockings, felt hats, woolen cloth, are manufactured in various localities; and there are tanneries, breweries, distilleries, glass-works, potteries, etc. The chief occupation, however, is the breeding of cattle, horses, and mules, all of which fetch good prices; and bees and silk-worms are tended for both diversion and profit.

S. is rich in minerals—silver, iron, copper, antimony, manganese, lead, zinc, asphalt, marble, granite, gypsum, sulphur, and salt. The principal mines are the spathic iron mine of St. Georges d'Hurtieres, and the lead mine of Macot. Coal is found in Maurienne.

The exports consist of the surplus of these products; also of cheese, hemp, silk both raw and spun, and wood of various sorts. S. is, except Bavaria, the only country of Europe in which advanced education is given gratuitously, there being 14 colleges for this purpose. Ordinary education also is well provided for in more than 1,200 schools, nearly all sustained on old foundations.

The Savoyards are honest, intelligent, religious, hospitable, and enthusiastically patriotic, even to a greater extent than the Swiss. More than 20,000 of them expatriate themselves annually in pursuit of various callings; but the greater portion return early in summer, while others wait till they have amassed wealth sufficient for the rest of their lives.

SAVOY', THE: group of buildings in the Strand, London, of which only a chapel remains, burned in 1860 and restored expensively by Queen Victoria. The palace of S. was built 1245 by the Earl of Savoy and Richmond, and overlooked the Thames. It was famous for its grandeur. Afterward it was owned by John of Gaunt. King John of France, defeated at Poitiers, was prisoner there until his death. In the rebellion of Wat Tyler the palace was burned, with all its contents, which the insurgent leaders would not permit to be removed—one man who disobeyed the order, it is said, being cast into the flames. On the ruins, Henry VII. built a retreat for the poor and disabled, but it was closed by Edward VI. because its privileges were abused by the unworthy—to be opened again, however, by Queen Mary, and finally abolished by Queen Anne. In one of the halls, the Independents met to frame the Savoy Confession (q.v.), in the time of Cromwell. At the Restoration, the buildings were used as a milit. and naval hospital, but in subsequent years fell into ruin, and, all but the chapel, were removed for the erection of Waterloo Bridge 1811. The burial of many noted persons in the chapel has contributed to its preservation.

SAVOYARD, n. *sa-voy'ârd:* native or inhabitant of Savoy.

SAVOY' CONFERENCE: ecclesiastical conference, 1661, Apr. 15—July 25, between 21 Episc. and 21 Presb. divines, at the Savoy Palace in London, with the view of ascertaining what concessions would satisfy the Presbyterians, and thereby lead to 'a perfect and entire unity and uniformity throughout the nation.' During the rule of the Protector Cromwell, the Church of England had been in an anomalous condition. Most of the clergy who held office during the early period of the civil wars were strong royalists, and either were ejected or fled, when the cause of the parliament triumphed. Their places had been supplied in many cases by zealous Presbyterians—at that time a more numerous body in England than afterward; thus it happened at the restoration of Charles II. that a considerable section of the ministers *within the church* were hostile to the reintroduction of Episc. govt. and worship. As a preliminary to such application of governmental pressure as should bring back the church to its uniformity, the king issued letters-patent dated Mar. 27, appointing 12 bishops, with 9 clergymen as assistants on the side of the Episc. Church, with an equal number of Presb. divines, 'to advise upon and review the *Book of Common Prayer.*' Among the Episc. commissioners were Frewen, Abp. of York, Sheldon, Bp. of London, Gauden of Exeter, Reynolds of Norwich, etc.: among their assistants, Dr. Peter Heylin, Dr. John Pearson, and Dr. Thomas Pierce. The most notable representatives of the Presb. party were Richard Baxter, Dr. John Wallis (then Savilian prof. of geometry at Oxford) Edmund Calamy, William Spurstow, and Matthew

Newcomen. The Presbyterians (according to Burnett) demanded that Abp. Usher's scheme of a 'reduced Episcopacy,' in which the elements of the Scotch system of presbyteries, synods, and general assemblies were combined with distinctions of ecclesiastical ranks, should be made the basis to begin with; that responses in the service should be given up; that the prayers in the Litany should be combined into one; that no lessons should be assigned from the Apocrypha; that the psalms read in the daily service should be according to the new translation; that the term regeneration (among others) should be struck out of the baptismal service; and that the use of the surplice, of the cross in baptism, of godfathers as sponsors, and of the holy days, should be abolished. They were told in reply that the commission had no authority to discuss questions affecting the government of the church, such as were contained in Abp. Usher's scheme; whereupon they proceeded to consider the minor points, such as the alterations of the Liturgy. Baxter with the consent of his party, hastily drew up a 'Reformed Liturgy' which the Episc. commissioners would not look at, considering the wholesale rejection of the older one *ultra vires* on their part. As might have been foreseen from the start, the parties separated without arriving at any conclusion; and this fruitless attempt at 'comprehension' was followed, 1662 by the famous 'Act of Uniformity,' the result of which was that 2,000 clergymen were forced to abandon their livings in the Church of England: see NONCONFORMISTS.

SAVOY' CONFESSION: statement of faith and church polity, adopted by the Independents (the Congregationalists of that day) convened in the Savoy (q.v.) London, 1658. A few of them had part in the Westminster Assembly, but their system of polity was not countenanced. In the time of Cromwell they came to the front, though the S. C. was not consummated until shortly before his death. Ministers and delegates from more than a hundred congregations constituted the assembly, the object being to secure union and strength. They claimed no authority as a body over the churches, but agreed on the confession as a 'Declaration,' embodying their opinion and advice; and, indeed, the previous Westminster Confession was first printed as *The Humble Advice of the Assembly of Divines*, etc. In respect to polity, the Savoy Assembly declared that a particular church consists of officers and members, the members having liberty and power to choose and set apart the officers, namely, pastors, teachers, elders, and deacons, who, when elected, are to be set apart by fasting and prayer, and by the imposition of the hands of the eldership of the particular church if there be any before constituted in it, but, if none, they are not the less rightly set apart and constituted ministers of the Lord Jesus. Others, however, besides pastors and teachers, when gifted, and approved by the people, may preach. On the other hand, ordination alone, without election or consent of a local church, does not constitute a

church officer. A church with officers, or lacking any except teachers, may administer the ordinances; and every church has power for admonition and excommunication, the admonition being private if the offense be known only to some. 'In cases of difficulties or differences, it is according to the mind of Christ that many churches holding communion together, do, by their managers, meet in a synod or council to consider and give advice; howbeit, those synods are not intrusted with any church power, properly so called, or with any jurisdiction over the churches.' Intercommunion of churches is recommended though all may not be walking according to the same rules of order. To guard against hierarchical tendencies, no one is to be ordained without having a call to a particular church. In general, the theory of the S. C. is that the church precedes the minister, rather than the minister the church. In respect to other matters than polity, the S. C. agrees word for word with the Westminster Confession, except in omission of certain clauses relating to civil magistrates, divorce, and the one that in part refers to community of goods.

SAVU ISLANDS, *sâ-vŏ'*, THE: in the Indian Ocean. Pop. 35,000. They are small, except Savu; 121° 45′—122° 7′ e. long., and 10° 25′—10° 36′ s. lat.; 237 sq. m. The islands are healthful, and moderately fertile, the thermometer ranging 76° to 88° F. by day, 68° to 70° by night. The products are those of the Archipelago, including tobacco and horses. The five rajahs have relations with the Dutch E. Indian govt., whose post-holder resides at Seba, the rajah of which possesses much influence, is a Christian, and has a missionary on the island. There is good anchorage at Seba. The Savunese are of Malay race—brave, and feared by their neighbors. Their religion is a traditionary heathenism, in which the offering of sacrifices of dogs is frequently practiced.

SAW, n. *saw* [Dut. *saege*, a narration; Dan., Sw., and Icel. *saga*, a narrative (see SAY)]: a saying; a proverb.—SYN. of 'saw': saying; maxim; axiom; proverb; apothegm.

SAW: pt. of SEE, which see.

SAW, n. *saw* [Gr. *säge;* It. *sega;* F. *scie;* Icel. *sög;* Dan. *sav;* Gael. *sàbh*, a saw: Low Ger. *suggen*, to hack, to cut with a blunt knife: comp. L. *secārĕ*, to cut]: cutting instrument with a toothed edge (see below): V. to cut or separate with the saw; to use a saw. SAW'ING, imp.: N. the act of one who saws. SAWED, pt. pp. *sawd*, or SAWN, pp. SAWYER, n. *saw'yĕr*, one whose occupation it is to cut up timber. SAWDUST, the small particles of wood separated by the working of a saw (see below). SAW-MILL, a place where timber is sawn by machinery (see below). SAW-PIT, the place over which timber is sawn. SAW-GIN, a machine used in dressing raw cotton. SAW-WREST or -SET, an instrument used to turn the teeth of a saw a little outward on both sides alternately. SAW-WORT, a plant having small sharp segments like the teeth of a saw, of the genus *Serrat'ŭla*, ord. *Compos'ĭtæ*.

SAW.

SAW: tool important in working wood and some other materials; usually consisting of a long strip of thin steel, with one edge cut into a continuous series of sharp teeth. Notwithstanding the great simplicity of the principle of its construction, it admits of great variation, and modern carpentry has brought into use many kinds of saws adapted to different purposes. The most common is the *Hand-saw* (fig. 1), in general use. For this the blade is broader at one end than the other, and a wooden handle is fixed to the broader end, without which it could not be used. This kind of saw is varied by the manner in which the teeth are cut and set, and in the shape and width of the blade, as in *Compass* or *Key Saws* for cutting small holes (fig. 2). Other kinds of hand-saws, e.g., the *Back-saw* (fig. 3) and the *Tenon-saw* (fig. 4), have straight blades, and the back is guarded and strengthened by a piece of

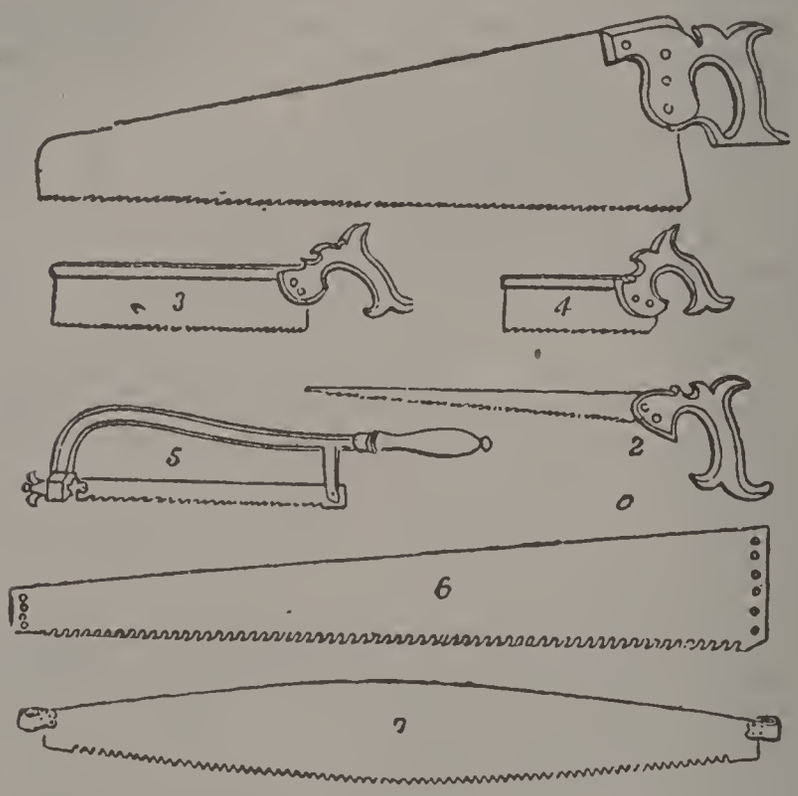


Fig. 7.

brass or iron bent over it. The *Bow-saw* (fig. 5) is used for a variety of purposes; the blade, always thin, is stretched like a bowstring to an iron frame. The *Frame-saw* (fig. 6), used chiefly in sawpits and mills for cutting timber longitudinally, is similar in shape to the ordinary hand-saw, but much larger, with holes at each end for fixing it in the frame by which it is moved up and down. For cutting timber transversely, the *Cross-cut-saw* (fig. 7) is used; this differs not only in shape, but in the set of the teeth, from other saws. The *Circular-saw* (fig. 8) has come into universal use wherever machinery can be had for working it. It is generally so fitted as to be worked under a flat bench, a part only of the blade projecting through a narrow slit in the top of the bench. It is made to revolve with great

rapidity, and the wood resting on the bench is pushed against the saw in the direction in which it is to be cut. It does its work with great rapidity. [To save space, several forms of teeth are shown in the figure, but each saw has but one kind.] The *Band-saw* consists of a very long band—or web, as it is called—of steel, usually very narrow, and with finely-cut teeth. The two ends are joined together so as to form an endless band, which is passed over two revolving drums, one above, and the other below the working-bench, through holes in which the saw passes. With this tool, the finest patterns in open-work may be cut out with great ease and rapidity. The *Scroll-saw*, made

Fig. 8.—Circular-saw.

of a very thin plate of steel, fastened in a spring frame and worked by a treadle, is used for cutting veneers and fancy-work from thin boards. The *Barrel-saw*, known also as the Crown-saw, Drum-saw, and by other names, is in the form of a cylinder, with teeth on its edge. It is used in cutting the slot near the end of the staves into which the edge of the head of a barrel is placed, and for various other purposes. The *Butchers'-saw* has a narrow blade so placed in its frame that its cutting edge can be turned at almost any desired angle. *Hack-saws* are made with strong blades and very small teeth which are but slightly set. They are used for cutting off nails, bolts, or other irons. There are a large number of other saws made for special purposes, and used by surgeons, or by workers in wood and metal; also various combinations of saws in the form of gangs. To avoid the rapid diminution in size, and consequently in the efficiency, of circular-saws caused by use, a form was invented in which the saw-plate was made of the desired size, with places in its rim for insertion of teeth. With this style new teeth can be substituted for those which are worn, and the saw can thus be kept at its original size. Various improvements have been made also in the form of teeth for both hand and mill saws.

The *pitch* of a saw is the slope or angle of the teeth. In the upright pitch, used in the old-style cross-cut saws, the sides are equal and the teeth cut as they are drawn back and forth by a man at each end of the saw. In the flat pitch the long and short lines of the teeth alternate, and the cutting is done when the saw is moved the way the teeth are pointed. In this country the teeth of hand-saws usually point from the handle, and cut when the saw is pushed; but in some eastern countries the reverse form is adopted, and the cutting is done as the saw is drawn toward the operator. The *set* of a saw is the spread of the points of the teeth to prevent clogging. One-half the teeth are bent slightly to one side, and the other half to the other, each alternate tooth being turned in the same direction. The set requires to be greater for cutting very soft woods than it does for cutting the hard and close-grained varieties.

SAWCEFLEM, n. *saws'flĕm* [L. *salsumphlegma*, salt-phlegm]: in *OE.*, a phlegm that tastes salt.

SAWDER, n. *saw'dĕr*, in SOFT SAWDER [a corruption of the phrase SOFT SOLDER]: mendacious flattery, with the view to wheedle and deceive.

SAW'DUST: waste particles thrown off in the sawing of wood; formerly of little or no use, now of some value for various purposes. Its most interesting application is its conversion into oxalic acid—having by its rapidity and cheapness displaced every other method of making that chemical. The process is very simple. The S. is first saturated with a concentrated solution of two parts of soda and one of potash; it is then placed in shallow iron pans, under which flues run from a furnace, whereby the iron pans are made hot, and the saturated S. runs into a semi-fluid, pasty state. It is stirred about actively with rakes, to bring it all in contact with the heated surface of the iron, and to granulate it for the succeeding operations. It is next dried in similar pans, only slightly heated. In this state it is oxalate of soda mixed with potash. It is then placed on the bed of a filter, and a solution of soda is allowed to percolate through it, which carries with it all the potash, leaving it approximately pure oxalate of soda. It is then transferred to a tank, in which it is mingled with a thin milk of lime, by which it is decomposed, the lime combining with the acid to form oxalate of lime, and the soda being set free. Lastly, the oxalate of lime is put into a leaden cistern, and sulphuric acid is poured in; this takes up the lime, and sets free the oxalic acid, which readily crystallizes on the sides of the leaden cistern, or on pieces of wood placed for the purpose.

Another interesting use of the S. of hard woods, such as rosewood, ebony, etc., is a French invention, named *Bois-durci*. Various kinds of S. used are reduced to fine powder, and mixed with blood into a paste; other materials are doubtless added, for when pressed into molds it is jet-black, and receives beautiful impressions, in the form of medallions and other small articles.

SAW'FISH (*Pristis*): genus of cartilaginous fishes, of the family *Pristidæ*, which is ranked with the Rays (q.v.), though the elongated form of the body agrees rather with the sharks. In a number of anatomical characters, however, the sawfishes differ from sharks, and agree with rays, conspicuously in the position of the gill-openings, which are not on the sides, as in sharks, but on the under-surface, as in rays. The mouth is on the under surface of the head, and is furnished with pavement-like teeth, adapted for crushing. But the S. is remarkable particularly for elongation of the snout into a flat, bony sword, armed on each edge with about 20 large, bony spines or teeth; a most formidable weapon, whence the fish has its name, and which

Sawfish (*Pristis antiquorum*).

it seems to use for killing prey, rushing among shoals of fishes, and slaying them right and left. Whales are said to be sometimes killed by sawfishes, and the saw has been occasionally driven into the hull of a ship. There are six or seven known species of S., distributed over the whole world. The COMMON S. (*P. antiquorum*), ranging from our coast to the Mediterranean, was known to the ancients. It is very widely distributed, both in polar and in tropical seas. It sometimes attains the length of 18 ft., including the saw. Sawfishes are seldom seen near the shore.

SAW'FLY (*Tenthredo*): Linnæan genus of insects of order *Hymenoptera*, now divided into many genera, and constituting a family with very numerous species. They derive their name from the ovipositor of the females, which is scaly, serrated, pointed, and inclosed in a sheath of two concave plates. By this instrument the female S. perforates the stalks or other parts of plants, laying an egg in each hole. The hole soon becomes filled with a frothy liquid, and sometimes a gall-like swelling is formed, within which the larva resides. The larvæ of many sawflies, however, live in no such nests, but feed on foliage, like caterpillars, which they resemble. One of the most common species of gooseberry 'caterpillar' is the larva of a S. (*Nematus ribesii*). Sawflies have the abdomen cylindrical, and so united to the thorax that the distinction is not easily perceived. They vary much in the antennæ. Both pairs of wings are divided by nervures into numerous cells. Among more notable species is the CORN S. (*Cephus*

pygmæus), which, in its perfect state, abounds on umbelliferous flowers, a shining black insect, marked with yellow, the abdomen elongated. The larva consumes the inside of the straw of corn, and, descending to the base of the straw, cuts it down level with the ground.—Another important species is the TURNIP S. (*Athalia spinarum*), reddish, spotted with black; the larva nearly black, and known by the names *Black Jack* and *Nigger*. The Turnip S. is sometimes very troublesome and destructive for a year or two, and then almost completely disappears for years.—

Turnip Sawfly (*Athalia spinarum*), in its various stages of Transformation.

The S. of the Pine (*Lophyrus pini*) sometimes, though not very often, strips pine and fir trees of their leaves.—The United States species are very numerous. The largest is *Cimbex ulmi*, which attacks the elm; its wings expand almost two inches, the female often being mistaken for a large hornet. The vine S. (*Selandria vitis*) is small, black, the body red above; the caterpillar is green, with black head and two rows of black dots on the sides. Other species attack fruit-trees.

SAW-MILL: large mill for cutting up timber by large saws worked by machinery. Saw-mills are worked by steam and water-power, and in some countries by wind. The arrangements are very simple: they consist of a fixed horizontal frame, with rollers at short intervals, upon which the tree or log of timber is laid; at the end of this, another frame is placed, in vertical position; it contains as many saws placed side by side as it is proposed to cut planks out of the log, and they are set as far apart as the desired thickness of the planks or boards. A rapid up-and-down motion is given to these saws by the machinery, and at the same time the log is pulled forward on the rollers by the same power, so as to be kept constantly up to the saws. The work is very rapid.—The circular-saw also is much used in mills for cutting planks and boards into pieces of almost any form.

SAWNY, n. *saw'nĭ*, or SANDY, n. *săn'dĭ:* ludicrous and familiar sobriquet of a Scotchman, being a corruption of 'Alexander.'

SAWYER, SYLVANUS: American inventor: b. Templeton, Mass., 1822, Apr. 15; d. 1895, Oct. 25. His attention was early turned to invention, and in 1839 he engaged in business with his brother-in-law in Augusta, Me., and invented a steam-engine, a screw propeller, and a car run by foot-power. His first big invention, however, was the machine for making chair-cane from rattan, first invented in 1843 and used in his factories after 1850. Sawyer then turned his attention to gun and rifle projectiles and made important inventions, his projectiles making the rifled cannon a practicality. He also invented in 1853 an arrangement by which shells would explode on impact, by use of percussion caps. These inventions were put into use and did great service against the Confederacy in the ensuing war. Other inventions, after the war, perfected the cast-steel rifled guns, the first battery of which he furnished. His other inventions include: 1867, calipers and dividers; 1868, steam generator; 1876, sole sewing-machine; 1882, centering watchmaker's lathe. The closing years of his life were devoted to agriculture.

SAX, n. *săks* [AS. *seax,* an ax, a knife]: a knife; a sword, a dagger; a slate-maker's ax, for trimming slates to shape.

SAXATILE, a. *săks'ă-tĭl* [L. *saxātĭlis,* that is found among rocks—from *saxum,* a rock]: pertaining to rocks, or living among them.

SAXE, *săks,* HERMANN MAURICE, Count of: one of the greatest warriors of the 18th c.: 1696, Oct. 28—1750, Nov. 30; b. Goslar; natural son of Augustus II. Elector of Saxony and King of Poland, and the Countess Aurora von Königsmark. When 12 years of age, he ran off from home, made his way to Flanders, joined the army of Marlborough, and took part in the capture of Lille and the siege of Tournay. With boyish love of change, he joined the Russo-Polish army before Stralsund (1711), and after the taking of Riga returned to Dresden, where his mother induced him, 1714, to espouse a young and amiable German heiress, whom he divorced later. In 1726 he was elected Duke of Courland, and for a time maintained himself in his new possession against both Russians and Poles, but was compelled to retire to France in the following year. Joining the army on the Rhine, under the Duke of Berwick, he signalized himself at the siege of Philipsburg (1734), and decided the battle of Ettingen by a desperate charge at the head of a division of grenadiers. For these services he was made lieutenant general 1736; and on the breaking out of the war of the Austrian Succession, he obtained command of the left wing of the army for invasion of Bohemia, and took the strongly fortified town of Prague by storm with marvelous celerity. The capture of Egra was similarly

effected a few days afterward, and the rest of the campaign showed his abilities in the field equal to his skill against fortifications. In 1744 he was made a marshal of France, and appointed to command the French army in Flanders, where he proved the soundness and superiority of his new system of tactics, by reducing to inaction an enemy much more numerous, and taking from him various important fortresses. The following year his army was reinforced; and though so ill with dropsy that he had to submit to tapping (Apr. 15), he laid siege to Tournay on the 22d, and, on the advance of the Duke of Cumberland to its relief, took position at Fontenoy, and, without relaxing the siege, awaited attack. He was assailed May 11, and the desperate valor of the English for a time bore down everything before them; but S. was carried about in his litter—a great wicker basket—encouraging his troops; and when the critical moment came, the fire of his artillery disorganized the English, and a charge of the French completed the victory. Four months afterward, every one of the numerous strong fortresses of Belgium was in his hands. In 1746, S., by a series of able maneuvers, threw back the allies on the right bank of the Maese, and gained (Oct. 11) the brilliant victory of Raucoux, for which he was rewarded with the title marshal-general, an honor which only Turenne had previously obtained. For the third time, at Laufeldt (1747, July 2), the victor of Culloden suffered complete defeat at the hands of S., whose favorite system of tactics was again brought into play; and the brilliant capture of Bergen-op-Zoom brought the allies to think of peace. The Dutch, however, were still disposed to hold out, till the capture of Maestricht (1748) destroyed their hopes; and the peace of Aix-la-Chapelle followed. S. had previously carried on correspondence with the great Frederick of Prussia, and he now visited him at Berlin, receiving a brilliant reception. In the following year, Frederick wrote to Voltaire: 'I have seen the hero of France, the Turenne of Louis XV.'s time. I have received much instruction from his discourse on the art of war. This general could teach all the generals in Europe.' S. retired to his estate of Chambord, and died there of dropsy. His work on the art of war, *Mes Rêveries*, was pub. Paris 1757.

S. was probably the greatest captain of his time, and a gallant and enterprising leader; but he was a mere soldier, and the offer of membership made to him by the Académie Française is ridiculous. S. had, however, the good sense to decline the proffer, and he did so in a sentence whose extraordinary orthography accidentally rebuked, more than the most cutting sarcasm could have done, the mean sycophancy of the Académie. He wrote: 'Ils *veule* me *fere* de *la cademie ; sela* m'*iret come* une *bage* a un *chas*.'

Of the many biographies of S., few are to be much trusted.—See *Moritz von Sachsen* (2d ed 1870), by Karl von Weber; and *Nouvelle Biographie Générale* (art. 'Saxe'). His character and genius are well, though not flatteringly, portrayed in Carlyle's *Life of Frederick the Great*.

SAXE, *săks*, JOHN GODFREY, LL.D.: poet: 1816, June 2 —1887, Mar. 31; b. Highgate, Vt. He graduated from Middlebury College 1839, studied law, commenced practice in Franklin co., Vt., 1843, served the state as atty. for Chittenden co. 1850–1, as atty.gen. 1856, and for a while in the customs department. He was editor of the *Burlington Sentinel* 1850–56; democratic candidate for gov. 1859 and 60; lived for several years in New York, where he engaged in writing and lecturing; and 1872 removed to Albany and joined the editorial staff of the *Evening Journal*. Many of his poems, including several humorous pieces, were extremely popular, and various collections have appeared. Among his numerous books were *Humorous and Satirical Poems* (1850); *The Times, the Telegraph, and Other Poems* (1865); and *Leisure Day Rhymes* (1875). He died at Albany.

SAXE-ALTENBURG, *săks-âl'tĕn-bĕrg* (Ger. SACHSEN-ALTENBURG, *sâch sĕn âl'tĕn-bûrch*): smallest of the minor Saxon states; a duchy bounded by Saxe-Weimar, Prussian Saxony, the kingdom of Saxony, Saxe-Meiningen, and Schwarzburg-Rudolstadt; and separated into two nearly equal parts by the interposed principality of Reuss-Gera. The e. portion, or *circle of Altenburg*, was formerly called *Pleissengau*, being watered by the Pleisse; it contains 254 Eng. sq. m.; pop. about 135,000. The w. part or *circle of Saal-Eisenberg*, is watered by the Saale, with the Orla and Rode; 256 Eng. sq. m.; pop. about 60,000. Total, 510 sq. m.; pop. (1880) 155,036; (1890) 170,867; (1900) 194,914, nearly half of whom are inhabitants of towns. The vast bulk of the people (999 in 1000) are Protestants, there being only about 193 Rom. Catholics, 16 Christian sectaries, and 10 Jews. The e. portion is open, undulating, and very fertile, and agriculture is admirably developed, so that much more corn is produced than is necessary for home-consumption. The peasants in this circle, though speaking the Thuringian dialect, show in dress, manners, and customs a family resemblance to the Wendish-speaking Serbs of Lusatia; and numerous names of places, especially those ending in *itz*, indicate their Slavic origin. They are celebrated throughout Germany for skill as agriculturists, and for superior intelligence, knowledge, and comparative wealth. The annual revenue is about $627,274; expenditure $626,767: debt $220,326. The troops are, of course, under the command of the German emperor. S. is a limited monarchy, in accordance with the constitution of 1831, modified somewhat by the events of 1848–9. By the law of 1870, the single chamber consists of 30 members, 9 representing the towns, 12 the country, and 9 the persons who pay most taxes. The govt. is in the hands of a ministry of three. As a member of the empire, S.-A. has one vote in the council, and one representative in the diet. Altenburg (q.v.) is the seat of govt. See SAXON STATES, MINOR: GERMANY.

SAXE-COBURG-GOTHA, *săks-kō'bĕrg-gō'tâ* (in Ger. SACHSEN KOBURG-GOTHA, *sâch'sĕn-kō'bûrch-gō'tâ*): third in size and pop. of the minor Saxon states; a duchy comprising the duchy of *Gotha*, between Prussia, Schwarzburg, Meiningen, and Weimar; 542 Eng. sq. m.; pop. (1880) 137,988: and the duchy of *Coburg*, 18 m. s. of Gotha, between Meiningen and Bavaria: 215 Eng. sq. m.; pop. (1880) 56,728. Total 755 Eng. sq.m.; pop. (1871) 174,339; (1880) 194,716; (1890) 206,329; (1900) 229,500, of these 212,514 Protestants, 2,956 Catholics, 580 Jews. Gotha lies on the n. side of the Thuringer-wald, which extends along and within its s. frontier; but the rest of this duchy consists of low, undulating, and very fertile land, and is watered by the Werra, affluent of the Weser; the Unstrut, tributary of the Saale; and several smaller streams. Coburg lies on the s. slope of the same range, is watered by the Itz and Rodach, affluents of the Main, and has extensive forests, and many beautiful valleys between the spurs of the Thuringer-wald. Of the surface of the whole duchy, $\frac{5}{9}$ is arable, $\frac{2}{7}$ is wood, $\frac{1}{14}$ waste land, and the rest pasture and gardens In the plains and valleys, the climate is mild and salubrious, but in mountainous parts of Gotha more inclement. Agriculture is the principal occupation; corn and flax are produced in abundance, also potatoes, and leguminous plants. The breeding of horses, cattle, and sheep is successfully conducted. The mineral wealth includes coal (chiefly in Gotha), iron, cobalt, manganese; also marble, porcelain-earth, mill-stones, and salt. The manufactures are not important, and are chiefly confined to Gotha. There is a large beet-sugar factory at Gotha. The extensive forests of the duchy employ a large proportion of the people in production of pitch, tar, and potash. The duchy is a limited monarchy, in accordance with the fundamental law of 1852. Coburg and Gotha have each a *landtag*, or diet; that of Coburg consisting of 11, and of Gotha of 19 deputies; besides which there is a common landtag for the whole state, composed of 7 of the Coburg, and 14 of the Gotha representatives, elected by their respective diets. The particular diets for the two duchies are elected by the people at large. There are two ministers for carrying on the govt.—one for Coburg, another for Gotha. As a member of the empire, S.-C.-G. has one vote in the federal council, and has the right to choose two deputies to the imperial diet. As in other German states, the troops are under the command of the German emperor. Education is well diffused; and the higher education is cultivated by the gymnasia and academies.

The finances of the two portions of the duchy are separately administered. The annual joint revenue is about $941,733; expenditure $805,940; debt $1,034,442. The present ducal family is distinguished for the spirited and liberal character of its members, as well as for physical and mental gifts. It is allied, with several royal families of Europe, the present duke's predecessor having been his uncle Alfred, son of the late Prince Albert and Queen Victoria of Great Britain. The heir-appar-

ent to the duchy is Arthur, Prince of Connaught, son of H. R. H. the Duke of Connaught. All the Saxon ruling families are descended from the Counts of Wettin, a place near Magdeburg. See SAXON STATES, MINOR: GERMANY.

SAXE HOLM, *săks hōm:* fictitious name of author (or authors) of a series of brief stories, which appeared first in *Scribner's Monthly*, and were collected and published in 2 vols. 1874–76. The authorship of the stories has never been confessed; but most of them have with much probability been attributed to Helen Hunt Jackson: see JACKSON, HELEN MARIA FISKE (HUNT).

SAXE-MEININGEN, *săks mī'nĭng-ĕn* (called also [Ger.] SACHSEN-MEININGEN-HILDEURGHAUSEN, *sách'sĕn-mī'nĭng-ĕn hĭlt'bûrch-how'zĕn*): second in size and pop. of the minor Saxon states; a duchy, consisting of one large crescent-shaped territory, immediately n. of Bavaria and Coburg, with the horns of the crescent pointing n.; aveaage breadth 10 m., length 80 m. along the s.w. slope of the Thuringian forest; 862 Eng. sq. m.; with two small isolated terri., Kranichfeld and Kamburg: total 953 sq. m.; pop. (1880) 207,075; (1890) 223,920; (1900) 250,731. In 1866, admin. reforms were introduced, and the territory formerly in 11 administrative dist. was distributed into 4. Of the total pop. 1900, 244,810 were Prot.; 4,170 Rom. Cath.; 1,321 Jews; and a small number of Christian sectaries. The crescent is composed of the old duchy of Meiningen, with the old duchy of Hildburghausen, and the principality of Saalfeld (both of which, with Kamburg, were annexed to Meiningen 1826). S. forms the s.w. of Thuringia (q.v.), and is traversed in the e. and n. by the Thuringer-wald, offshoots from which also cover the w., while the Rhön-gebirge enters the country at the s.w. Its surface is thus necessarily hilly, in some places even mountainous; but between the mountain ridges are numerous fruitful valleys, and that of the Werra is one of the most fertile and picturesque in Germany. The Werra, Saale, Milz, Steinach, Itz, etc., water the country. Two-fifths of the country is arable land; a nearly equal extent is under wood. In the lower lands, agriculture is in an advanced condition; corn, potatoes, hemp, flax, and tobacco are the chief crops.

The mining industry of the e. and n. is considerable, employing recently about 550 men; and the important mineral products are iron, copper, cobalt, coal, porcelain-clay, sulphur, and salt from the works of Salzungen, Neusulza, and Friedrichshall. S.-M. is also an active manufacturing district, chiefly in woolen, cotton, and linen fabrics, and paper; and brewing, distilling, making of glass and porcelain, and other industries are prosecuted. The fabrication of wooden toys in the district around Sonneburg employed, a few years since, 2,092 men; the product is bought by the Sonneburg dealers for export. A rape-sugar factory is maintained.—S.-M. is a limited monarchy, in accordance with the fundamental law of 1829, and the laws of 1871 and 73. The diet consists of 24 representatives—4 representing the more extensive landowners, 4 the

persons who pay most taxes, and 16 being the deputies of the rest of the inhabitants. As a member of the empire, S.-M. has one vote in the federal council, and sends two deputies to the diet of the empire. The troops of S.-M. form part of the imperial army. The govt. is carried on by four ministers, each of whom heads a separate dept. In 1900-2 the revenue was 8,744,478 marks; expenditure 7,888,598 marks: debt 8,210,919 marks. S.-M. had for some time the distinction of being the best-governed state in Germany. See SAXON STATES, MINOR: GERMANY.

SAXE-WEIMAR-EISENACH, *săks-wī'mĕr-ī'zĕn-ăn* (Ger. SACHSEN-WEIMAR-EISENACH, *sâch'sĕn-vī'mâr-ī'zĕn-âch*): largest of the Thuringian and of the minor Saxon states; a grand duchy, consisting of *Weimar*, between Prussia, Altenburg, and Schwarzburg-Rudolstadt, which contains (inclusive of Allstädt, on the Unstrut, within Prussia, 45 Eng. sq. m., and Ilmenau, in s.e. Gotha, 32 Eng. sq. m.) 679 English sq. m.; pop. (1880) 168,071; *Eisenach*, the w. portion, n. of Meiningen and Bavaria, which contains (inclusive of Ostheim, in the Rhön-gebirge, in Bavaria, 23 Eng. sq. m.) 465 Eng. sq. m.; pop. (1880) 90,852; and *Neustadt*, on the w. boundary of the kingdom of Saxony, which contains 242 Eng. sq. m.; pop. (1880) 50,654. Total 1,388 Eng. sq. m.; pop. (1871) 286,183; (1880) 309,577, of whom 10,267 were Rom. Cath., these and more than 1,100 Jews being chiefly in Eisenach; (1900) 362,873. The Eisenach portion is traversed in the n. by the Thüringer-wald, and in the s. by the Rhön-gebirge, the intermediate districts being hilly and undulating, and watered by the Werra and its feeders, the Fulda, Ulster, Suhl, and Orsel. The Neustadt division is traversed from s.e. to n.w. by offshoots of the Erz-gebirge; but most of the surface belongs to the plain of the Saale, and is watered by the Elster and Orla, affluents of that river. The Weimar portion also is partly hilly, and partly belongs to the plain of the Saale, which, with its tributary, the Ilm, traverses it. The highest peak in the grand duchy is Hinkelhahn (2,694 ft.), in the detached territory of Ilmenau. The climate is somewhat inclement in the high lands, more temperate in the plains, and particularly pleasant in the valley of the Saale. Of the whole surface, about $\frac{3}{5}$ is arable, $\frac{3}{11}$ is forest. Agriculture is in an advanced condition; much grain is produced and potatoes, pulse, hemp, flax, hops, and (on the banks of the Saale) vines are cultivated. Horse and cattle breeding is a common pursuit in Neustadt and Eisenach, and sheep-breeding in Weimar, the sheep having the usual good reputation of the Saxon breed. The mineral wealth comprises coal, iron, copper, cobalt, and marble. Eisenach is the chief seat of manufactures, except woolens, made principally in Neustadt. The govt. is, according to the revised fundamental law of 1850, a limited monarchy; the diet, or landtag, is composed of 33 deputies, of whom five are chosen by land owners having a yearly income of from 3,000 marks upwards; 5 by those who possess the same income from other sources, and 23 by universal suffrage. The govt. is administered by three heads of

departments. As a member of the empire, S. has one vote in the federal council, and elects three deputies to the imperial diet. The troops of S. form part of one of the Thuringian regiments in the 11th *corps d'armée* of the empire. The annual revenue and expenditure are about $1,551,705; debt $1,347,058. The Grand Duke of Weimar is the chief of the Ernestine branch of the House of Saxony. The most celebrated of the Weimar family was Duke Karl-August, the Mæcenas of the art, literature, and science of Germany, who ruled 1775–1828, and earnestly favored the development of public prosperity and the progress of education. Under his care, the Univ. of Jena became an intellectual focus to Germany; and the presence of Herder, Goethe, Schiller, and others, at his court, entitled it to be denominated the abode of the Muses. He also elevated the theatre of Weimar to its present position as the chief German school of dramatic art. In 1806 he joined the Confederation of the Rhine with the title duke, and received from the Congress of Vienna an accession of territory and the title grand duke. His successors have followed in his footsteps. See SAXON STATES, MINOR: GERMANY.

SAX-HORN, n. *săks'hawrn* [after the inventor Charles Joseph *Sax*]: name of a group of six brass wind-instruments. They have a wide mouthpiece and three, four, or five cylinders, so that each horn is capable of playing all the notes of its scale without difficulty. The tone is round, pure, and full, and the horns are much employed in milit. bands. Called also SAX-CORNET.

SAXICAVOUS, a. *săks-ĭ-kā'vŭs* [L. *saxum*, a rock; *cavus*, hollow]: a term applied to animals that make holes in rocks and live in them.

SAXICOLOUS, a. *săks-ĭk'ō-lŭs* [L. *saxum*, a rock; *colo*, I inhabit]: in *bot.*, growing on rocks.

SAXIFRAGE, n. *săks'ĭ-frāj* [F.—from L. *saxifrăgus*, stone-breaking—from *saxum*, a rock; *frango*, I break]: a plant or medicine formerly supposed to have the power of dissolving stone in the bladder. SAXIF'RAGOUS, a. *-ĭf'ră-gŭs*, dissolving stone, especially in the bladder. *Saxifrage* (*Saxifraga*) is a genus of plants of nat. order *Saxifrageæ* or *Saxifragaceæ*. This order has a calyx usually of five sepals, more or less cohering at the base; a corolla usually of five perigynous petals, alternate with the sepals, rarely lacking; perigynous stamens; a hypogynous or perigynous disk; an ovary usually of two carpels, cohering more or less by their face, but diverging at the apex; fruit generally a 1–2-celled capsule, the cells opening at the ventral suture, and often divaricating when ripe; the seeds usually minute and numerous. The order *Saxifrageæ* is sometimes regarded as including more than 900 species, divided into several sub-orders, which are elevated by some botanists into distinct orders—leaving, however, more than 300 species to the reduced order SAXIFRAGEÆ, which contains herbaceous plants, often growing in patches, with entire or divided alternate exstipulate leaves

natives chiefly of mountainous tracts in the n. hemisphere, and often found up to the limits of perpetual snow, some of them forming there a rich and beautiful turf, which they adorn with their pleasing flowers. Some of the genus *Saxifraga* are well known in gardens, and are employed to cover rock-works, etc. *S. umbrosa*, London Pride, or

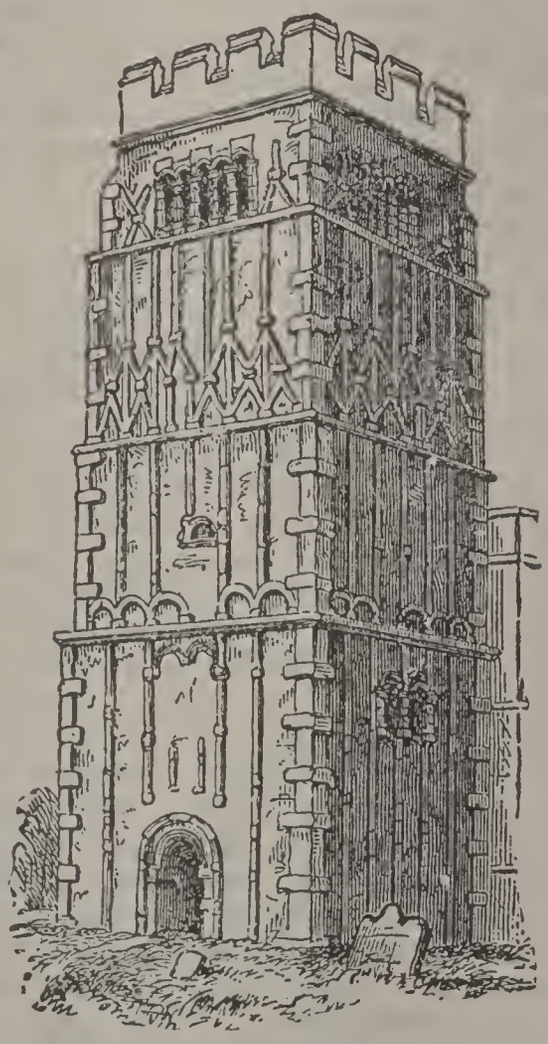
Saxifrage (*S. stellaris*).

None-so-pretty, is familiar in cottage gardens: it is native of the hills of Spain, and of s. and w. Ireland.—Gray includes, in the family, the currants, mock-oranges, deutzias, hydrangeas, alum-roots, etc. The 'Beefsteak Geranium,' cultivated under that mistaken name, is a saxifrage.

SAXO-GRAMMATICUS, *săks'ō grăm-măt'ĭ-kŭs* (i.e., Saxo the 'Grammarian' or 'Scholar'): most celebrated of early Danish chroniclers. He lived in the 12th c.; about 1180 became sec. to Abp. Absalon; and is said to have died at Koeskilde 1204. S. undoubtedly formed his style on that of the later Roman historians, particularly Valerius Maximus and Martianus Capella; yet in his whole mode of representation, he belongs to the school of mediæval chroniclers, though ranking first in that school. Though a cleric, he seems to have avoided the sway of clerical prejudices. His work, *Historia Danica*, which at the abp.'s instigation he began to write about 1185, consists of 16 books. The earlier portions are not critical; but in regard to times near his own, S. is of value as an authority, though he evidently lacked a keen critical sense. According to his own statement, he derived his knowledge of the remoter period of Danish history—the 'Heroic Age' of the North—from old songs, Runic inscriptions, and the historical notices and traditions of the Icelanders; but he is too patriotic a Dane to be impartial in his treatment of the Danish sagas, though a rudimentary critical tendency is occasionally

visible. The best ed. of the *Historia Danica* is that undertaken by P. E. Müller, and finished by J. M. Velschov (Copen. 1839), furnished with a complete critical apparatus. There are good translations from the original Latin into Danish.

SAXON, n. *săks'n* [AS. *Seaxa*, a Saxon; *Seaxan*, the Saxons—perhaps from *seax*, a short sword, a dagger]: one of the people who conquered England in the 5th and 6th c.: the language of the Saxons, known as Anglo-Saxon (see ANGLO-SAXONS: ANGLO-SAXON LANGUAGE AND LITERATURE), and regarded as the basis of the English language: a native of modern Saxony (see SAXONS: SAXONY): ADJ. pertaining to the Saxons. SAX'ONISM, n. *-n-ĭzm*, an idiom of the Saxon language. SAX'ONIST, n. *-ĭst*, one versed in the Saxon language. SAX'ONY, n. *-ĭ*, second in importance and pop. of the minor German states (see below): a cloth made of wool produced there. SAXON BLUE, sulphate of indigo, used as a dye-stuff.



Tower of Earl's Barton, Northamptonshire.
(From Parker's *Glossary of Architecture.*)

SAXON ARCHITECTURE: style of building in England before the introduction of the Norman architecture at the Conquest. There are few specimens remaining which can be depended on as genuine. The Saxons built chiefly

in wood, and all their wooden edifices are now lost. It seems probable that they used a rude and simple style, not unlike Early Norman. There are several buildings in England which Rickman considers entitled to rank as Saxon: among these, the Tower of Earl's Barton, Northamptonshire, is one of the best examples. The walls are of rough masonry, very thick, without buttresses, and sometimes of herring-bone work; the towers and pillars thick in proportion to height, the former being sometimes not more than three diameters high; the quoins or angle masonry are of hewn stones set alternately on end and horizontally ('long-and-short' work); the arches of doorways and windows are rounded, or sometimes these openings have triangular heads, their jambs of long-and-short work carrying either rudely-carved imposts or capitals with square abaci. Sometimes heavy moldings run round the arches, and when two or more arches are conjoined in an arcade these are on heavy low shafts formed like balusters. Window openings are often splayed both from the inside and from the outside, and the windows themselves are small. On the outside of towers, walls, etc., there are often found slightly projecting pilaster-like shafts, usually formed of the long-and-short work characteristic of the quoins.

SAX'ON LAND. See TRANSYLVANIA.

SAX'ONS (L. *Saxŏnes*, Ger. *Sachsen*): German people, mentioned first by Ptolemy (d. after A.D. 161), who makes them inhabit a district s. of the Cimbrian Peninsula. Toward the end of the 3d c., a 'Saxon League' or 'Confederation' makes its appearance in n.w. Germany, to which belonged, besides Saxons proper, the Cherusci, the Angrivarii, and the largest part of the Chauci. In the times of Emperors Julian and Valentinian, Saxons and Franks invaded the Roman territory; but their piratical descents on the coasts of Britain and Gaul are far more famous. These commenced at an unknown period, but probably much earlier than has been commonly supposed. Recent investigations seem to prove that Saxons had established themselves in England long before the time of the mythical Hengist and Horsa (see ANGLO-SAXONS); and we know that, as early as 287, Carausius, a Belgic admiral in the Roman service, made himself 'Augustus' in Britain by their help. They had firmly rooted themselves, at the beginning of the 5th c., in the present Normandy, where a tract of land was named after them, the *Limes Saxonicus*. They fought against Attila (q.v.) in the Catalaunian Plain, 451. They also obtained a footing at the mouth of the Loire; but all the Saxons who settled in France 'disappeared' before the Franks, i.e., were probably incorporated with their more powerful kinsmen of s. Germany. At home, the Saxons (called *Alt Sachsen*, or 'Old Saxons,' to distinguish them from the emigrant hordes who found their way to England and France) enlarged, by conquest, their territory n. and n.w.

as far as the North Sea, the Yssel, and the Rhine; s., as far as the Sieg, and nearly to the Eder; e., to the Weser and Werra, the Southern Harz, the Elbe, and the Lower Saale. They, with the Franks, destroyed the kingdom of the Thuringians 531, and obtained possession of the land between the Harz and the Unstrut; but this district was later forced to acknowledge the Frankish sovereignty. From 719, wars between the Saxons and the Franks became constant; but the latter, after 772, were generally successful, in spite of the vigorous resistance offered by Wittekind; and 804 the Saxons were finally subjugated by the arms of Charlemagne. Wittekind was the last Saxon king, and the first Saxon duke of the German empire. A collection of the old national laws and usages of the Saxons, under the title *Lex Saxonum*, was made during the reign of Charlemagne.

From two MSS., one preserved at Munich, the other in the British Museum, A. Schmeller published (1830-40) an 'Old Saxon' poem of the 9th c., called *Hêliand*, i.e., the 'Healer,' or 'Saviour,' which narrates in alliterative verse the 'History of Christ' according to the Gospels, whence it is called also the 'Old Saxon Gospel Harmony.' It is probably a part of a more comprehensive work, embracing a poetical treatment of the history of the Old and New Test., which Ludvig the Pious intrusted to some distinguished Saxon singer. This unknown poet lived, as his language leads us to conjecture, somewhere between Münster, Essen, and Kleve. His work is not only the almost sole monument of the old Saxon tongue, but is also of high poetical value, through its warmth of feeling, and the strength and splendor of its diction.

SAX'ONS, LAW OF THE: See SALIC LAW.

SAX'ON STATES, MINOR: now comprising the four Saxon duchies, Saxe-Altenburg (q.v.), Saxe-Coburg-Gotha (q.v.), Saxe-Meiningen (q.v.), and Saxe-Weimar-Eisenach (q.v.). The capitulation of Wittenberg, which followed the rout of Mühlberg (see SAXONY), and deprived John Frederick the Magnanimous of the electorate of Saxony, at the same time despoiled him of a large portion of the hereditary possessions of the Ernestine branch. The remainder, amounting—after the acquisition of Coburg, Altenburg, Eisenburg, etc., 1554—to little more than one-fifth of the whole Saxon territory (see SAXONY), was divided into two portions, *Saxe-Gotha* and *Saxe-Weimar*, the former falling to John Fredrick II., and the latter to John William, the two sons of the deposed elector. Each of these portions was afterward subdivided, the former into *Saxe-Coburg* and *Saxe-Eisenach*, and the latter (1573) into *Saxe-Weimar* and *Saxe-Altenburg*. A bewildering series of subdivisions and reunions followed. The gradual adoption of the law of primogeniture during the 18th c., and the extinction of various cadet branches, has left the four states above named.

SAX'ON SWITZ'ERLAND. See SAXONY.

SAX'ONY (Ger. SACHSEN, *sâch'sen*), KINGDOM OF: 2nd in importance and population, and 4th in extent of the minor German states; bounded n. by Prussia, s. by Austria, w. by Bavaria and the Saxon Duchies; 5,787 sq. m. Pop. (1881) 2,972,805; (1900) 4,202,216; divided into four districts: Dresden, Leipzig, Zwickau, Bautzen.

The term S. has three applications in German history (1) a mediæval duchy in n. Germany; (2) a subsequent electorate which afterward became the present kingdom of S. (chief subject of this article); (3) a ducal province of Prussia formed 1815 out of part of the electorate. The electorate had with the mediæval duchy merely a politica (not local or racial) connection.

The kingdom is somewhat of the form of a right-angled triangle, with the right angle in the n.w., and the longer side along the foot of the Erz-gebirge range, which sends its spurs n. over the s. half of the country, giving to that portion an almost mountainous character, while the n. half remains a flat or undulating plain. The whole country, except a small portion in the extreme e. which belongs to the Oder basin and is watered by the Neisse, is drained by the Elbe (wholly navigable in S.) and its tributaries the Muglitz, Wilde-Weisseritz, Trubsch, Mulde, and White Elster, on the w.; and the Wessnitz, Black Elster, and Spree, on the e. From the point where the Elbe bursts through the Erz-gebirge chain to within about 8 m of Dresden, it traverses a district rich in picturesque scenery, to which the not very appropriate name *Saxon Switzerland* has been given. This district, averaging about 24 m. long by 23 broad, is an elevated plateau of coarse crumbling sandstone (much resembling the English greensand); and though destitute of the perpetually snow-clad mountains, glaciers, serrated ridges, and escarped peaks which give a lofty grandeur to its namesake, it can boast of features equally peculiar and strikingly romantic. From the soft nature of the rock, it has yielded freely to the action of the mountain rills, which rise from the hills on its e. and w. borders, and converge to the Elbe, and is cut up in all directions by deep narrow gorges (so symmetrical in their formation as to resemble artificial lanes), the constantly deepening beds of these mountain torrents, which here form cascades, there sullenly glide through deep vales bordered by rocks of fantastic forms, or by steep rugged slopes thickly clad with trees High above the level of the plateau rise towering rocks, some pyramidal or conical, others pillar-like, while a few taper almost to a point, and then bulge out at the top; all clearly testifying to the agency by which they have been produced. The mediæval knights took advantage of these curious results of nature's so-called freaks, to erect castles upon the summits of some of them, several of these castles still exist, and one of them, Königstein, is almost the only virgin fortress in Europe. The most remarkable of these peaks are Königstein (864 ft.), Lilienstein (1,254 ft.), the Bastei (600 ft.), Nonnenstein, Jungfernsprung, and seven others, each having its group of traditionary gnomes and kobolds. The

lakes of S. are unimportant, and the only canals are those between the mines and ore-mills.

Climate, Soil, Products, etc.—The climate is healthful, and on the whole temperate. Of the whole surface, more than one-half is arable, nearly one-third is in forest, about one-ninth in meadow. The arable land has long been in high cultivation, as is the case with the whole of Upper S. (see *History*); yet notwithstanding this, and its extreme fertility, the product is hardly sufficient for the dense population (441 to the Eng. sq. m.). Agricultural products consist of the usual cereals and leguminous plants, with rape, buckwheat, hops, flax, and potatoes, and all kinds of fruits suited to the climate. The forests, the largest of which are in the Voigt-land (s.w. corner of Zwickau) and along the n. slopes of the Erz-gebirge, supply excellent timber in such abundance as to render them one of the great sources of industry and wealth. The rearing of cattle is an important employment in the mountainous districts of the s.w. Sheep, for which S. was formerly famous, have been less generally reared of late years; though, from the introduction of merinos, and increased care in breeding and rearing, the quality of the wool has much improved, and at the present day it has a high place in the markets of the world. Minerals are another great source of national wealth, the ore being both rich and abundant, and the processes of excavation and smelting highly developed. The mineral wealth includes silver, tin, iron, cobalt, bismuth, zinc, lead, nickel, arsenic, antimony and other metals; besides coal, marble, porcelain-earth, vitrol, and various gems. Coal occurs near Dresden and Zurckau. Peat is abundant in the Erz-gebirge; sandstone on the hills of the Elbe; fine porcelain clay near Meissen. The chief mining districts are Freiberg, silver and lead; Altenberg, tin; Schneeberg, cobalt, nickel and ironstone; and Johanngeorgenstadt, ironstone and silver mines; 150 out of 236 metallic mines are worked. Precious stones are found in the S. mountains; but there are no salt mines.

Manufactures, Commerce, etc.—Manufacturing industry has been greatly developed, and several branches have been brought near perfection. This labor employs nearly three-fifths of the whole people. The oldest manufacture is that of linen, which at present employs more than 16,000 looms; but it is eclipsed by the cotton-spinning and weaving, which is the most important Saxon industry, has its chief seats at Chemnitz, Frankenberg, Zschoppau, Folkland, and Lausitz, and gives work to more than 150 spinning-mills The woolen manufactures also are extensive. Broadcloth, thread, merinos, silks, mixed silk and woolen wares, etc., are produced in considerable quantity and of excellent quality; the muslin-de-laines being still preferred by many to those of England and France, while the laces and embroideries preserve their ancient well-won reputation. Saxon pottery and porcelain have long been famous.

The chief centres of manufacturing industry are in Bautzen and in the mountainous country n. of the Erz-gebirge. This extension of manufacture, combined with deficient supply of home-grown articles of consumption, demands an extensive foreign commerce, carried on chiefly through the medium of the great fairs of Leipzig (q.v.). The chief imports are corn, wine, salt (not found in S., though common in Prussian Saxony), cotton, silk, flax, hemp, wool, coffee, tea, etc. The country is well provided with roads, railways, and lines of telegraph.

Government, Religion, Education, Revenue, etc.—The govt. of this interesting country—whose history leaves on the mind a firm sense both of past ages and of present activity—is a limited monarchy, hereditary in the Albertine line, and carried on according to the constitution of 1831, modified by changes 1849, 51, 60, 61, 68, and 74. By the electoral law 1868, the first of the two chambers which constitute the legislature consists of the princes of the royal family, certain nobles, representatives of the Luth. and Rom. Cath. churches, the chief proprietors, representatives of the universities, and the burgomasters of the eight principal towns. The second chamber comprises 35 deputies from the towns, and 45 from the rural communes. The supreme administration is by six ministers (of Justice, Finance, the Interior, War, Religion and Education, and Foreign Affairs). The established religion is the Lutheran, though the reigning family, since the time of Fr. Augustus I., have been Rom. Cath. The church dept. must, so long as the reigning family remains Rom. Cath., be administered by a member of the established church. In 1895 there were 3,954,132 Prot.; 197,005 Cath; 22,214 other Chris.; 12,416 Jews; and 369 of other relig. The pop. of S. is far from purely Ger.; in 1885, there still were more than 49,000 who spoke Wendish. S. has more than 3,000 elementary schools, 17 gymnasia, and 34 *real-schulen;* the univ. is at Leipzig. In 1901-2 the revenue and expenditure were 97,799,960 marks; debt 980,136,200 marks (largely for railways). The Saxon troops form the 12th *corps d'armée* of the German empire. S. has a war ministry of its own; but after the war of 1866, S. paid the penalty of her opposition to Prussia by being compelled to make over to the king of Prussia the supreme military command of the Saxon army, the right to garrison the fortress of Königstein, the management of the postal, railway, and telegraphic systems, and the charge of the diplomatic representation of S. abroad. As a member of the German empire, S. has four votes in the federal council, and has right to send 23 deputies to the diet.

History of the Great Duchy of Lower Saxony, and of the Ascanian Electorate of Upper Saxony.—After the final conquest of the Saxons by Charlemagne, they became one of the components of the German empire; but their country did not correspond to what is now known as S. It included the most of the country between the Elbe, the Harz Mountains, the Rhine, and Friesland; and, 850, was

erected into a dukedom, with Lubeck for its cap., and ruled by hereditary princes. Ludolf, first duke, is said to have been great-grandson of Wittekind, but nothing is certainly known of his ancestry. His second son, Otho the Illustrious (ruled 880–912), was the most distinguished of the German princes; he fought valiantly against the Normans, and, on the extinction of the Carlovingian dynasty (911), refused the crown of Germany unanimously offered him by the electors. His son Duke Henry (ruled 912–936), surnamed 'the Fowler,' obtained the throne (919), and commenced the Saxon line of German sovereigns, which was continued by Otho I. (q.v.), Otho II. (q.v.), Otho III. (q.v.), and Henry II., and ended 1024. Otho I. handed over the great duchy of S. to Hermann Billung 960, on condition of milit. service; and this family held it till 1106. Under the Billung dynasty, the prosperity of the country greatly increased, and Meissen, Thuringia, East S., in Lusatia, S. in the Northern Mark, Anhalt, Saltzwedel, and Slesvig, all were dependent on the Saxon duke. A portion of S. had, however, been reserved by Emperor Otho I., for his nephew Bruno, who founded a lordship of Saxony-Brunswick; and, in the middle of the 11th c., a duchy of 'Saxony on the Weser' also was founded; but both of these (united by marriage 1090 or 1096) came (1113) by marriage to Count Lothar of Supplinburg, who was invested also (1106) with the great duchy of S., now more extensive than ever before, stretching from the Unstrut, in Gotha, to the Eider, and from the Rhine to Pomerania. After Lothar's accession to the imperial throne 1125, he handed over (1127) the duchy to his son-in-law, Henry the Proud, the Guelphic Duke of Bavaria, who was thus the ruler of more than half of Germany; but this overgrown dominion did not long continue, for under his son, Henry the Lion (q.v.), it was wrested (1180) from the House of Guelph, Bavaria being given to the House of Wittelsbach; E. Saxony created an electorate, and given to Bernhard of Ascania; Brunswick and Luneburg mostly restored to Henry's son; while the numerous and powerful bishops of n. Germany divided among themselves Westphalia, Oldenburg, and many portions of Luneburg and Brunswick; Mecklenburg and Holstein became independent, and the Saxon palatinate in Thuringia went to the Landgraf Ludwig. S., now shorn of its greatness, consisted chiefly of what is now Prussian S., a few districts separated from Brandenburg, and Saxe-Lauenburg, the last being the only portion of the great duchy of S., or *Lower Saxony*, as it is called, which retained the name. Wittenberg was cap. of the new duchy. S. was diminished 1211 by the separation of Anhalt as a principality; and 1260, it was permanently divided into two portions, *Saxe-Lauenburg* and *Saxe-Wittenberg*, to the latter of which the electoral dignity remained, and to which, on subsequent dispute between the two branches, it was confirmed by the celebrated Golden Bull (1356). The Ascanian line became extinct 1422 with Duke Albert III., and the duchy then passed to Frederick the Warlike,

Markgraf of Misnia, and Landgraf of Thuringia, who was invested with it by Emperor Sigismund 1423. His possessions consisted of Thuringia, the present kingdom of S., Prussian S., in fact, the whole of *Upper Saxony* except Anhalt.

History of the Country now known as Saxony.—The earliest inhabitants of Upper S., since the Christian era, were the Hermunduri (see THURINGIA); and on the destruction of the great Thuringian kingdom in the beginning of the 6th c., their settlements were taken possession of by the Sorbs, a Slavic race, who practiced agriculture and cattle-breeding. The Carlovingian rulers, dissatisfied with the ingress of those non-German tribes, erected 'marks' to bar their progress; and Duke Otho the Illustrious of S., and his celebrated son, Henry the Fowler, warred against them. The latter—subduing the Heveller, the Daleminzer, and the Miltzer—founded in their country the marks of Brandenburg (q.v.), Misnia (Meissen), and Lusatia (Lausitz), and planted colonies of Germans among the Sorbs.—In 1090, the mark was bestowed on the House of Wettin (supposed off-shoot of the race of Wittekind) and was confirmed as an hereditary possession to that family 1127; and the markgraf, Henry the Illustrious (ruled 1221–88), whose mother was heiress to the landgrafdom of Thuringia with its appendages, combined the whole into a powerful state. Business, commerce, and mining industry flourished; great roads for commercial purposes were constructed throughout the country, and the Leipzig fairs were established; and, notwithstanding much internal discord, and frequent partitions of S., its prosperity increased. —At last, FREDERICK THE WARLIKE (ruled 1381–1428) succeeded in uniting the severed portions of S., to which were added, by purchase and marriage, various districts in Franconia; and 1423 the electorate of S. (see above). The Saxon elector was now one of the most powerful princes of Germany; but the fatal practice of subdividing the father's territories among his sons continued, and during the reign of the Elector FREDERICK THE MILD (ruled 1428–64), whose brother William had obtained Thuringia, a civil war broke out, and was carried on for years.—ERNEST (ruled 1464–86) and ALBERT (ruled 1464–1500), sons of Frederick, in accordance with the will of their father, reigned conjointly over the hereditary domains of the family (the duchy of S., with the electoral dignity, being reserved always to the eldest) till the death of their uncle (1485), when Ernest obtained Thuringia, and Albert Meissen, while Osterland was equally divided between them, Ernest, founder of the *Ernestine*, which was also the *elder* or *electoral line*, was succeeded by his son, FREDERICK THE WISE (ruled 1486–1525), who favored the Reformation, and firmly supported and protected Luther against the overwhelming power of the Rom. Cath. party, which he was enabled to do by his personal influence with Emperors Maximilian and Charles V.—His brother and successor, JOHN THE CONSTANT (ruled 1525–32), was still more a partizan of the new doctrines, as was also his son

and successor, JOHN FREDERICK THE MAGNANIMOUS (ruled 1532–47); but the latter, by the defeat of Mühlberg (q.v.) (see SCHMALKALD), was forced to resign both his electoral dignity and his states.—Albert, founder of the *younger, ducal*, or *Albertine line*, was succeeded by his sons, GEORGE THE BEARDED (q.v.) (ruled 1500–39), a rabid Rom. Catholic, and HENRY THE PIOUS (ruled 1539–41), a no less zealous Protestant; after whom came the celebrated MAURICE (ruled 1541–47), who was a professed Protestant, but joined the Rom. Cath. party against the League of Schmalkald, forced the Prot. army to retreat from the Danube, and took possession of the estates of the Elector John Frederick, who, however, speedily drove him out, and took possession of ducal S. in his turn. After the rout of the Protestants at Mühlberg, Maurice received the electoral title (1547–53), and the greater portion of the estates of his vanquished cousin. But the arbitrary political measures and religious severities which were either instituted or promoted by the emperor induced Maurice to join the Protestants, and, by a sudden march on Innsbruck, he forced the emperor to agree to the peace of Passau. New tyrannical measures of the emperor caused him to look to an alliance with France, but the scheme was frustrated by his death, 1553, July 11, near Sievershausen, where two days before he had totally defeated the Markgraf Albert of Kulmbach, a secret agent of the emperor. —His brother, AUGUSTUS I. (q.v.) (ruled 1553–86), the first economist of the age, has left a memory dear to S., from the numerous excellent institutions which he established; he considerably increased his territories by purchase and otherwise, and restored Altenburg to the Ernestine line.—CHRISTIAN I. (ruled 1586–91), a weak prince, surrendered the reins of govt. to his chancellor, Crell, who was sacrificed, in the succeeding reign of CHRISTIAN II. (ruled 1591–1611), to the revenge of the offended nobility. Christian II. weakly neglected to assert his claims to Juliers, on the death of its last duke, and allowed it to become a prey to Brandenburg and the palatine House of Neuburg; but his brother, JOHN GEORGE I. (ruled 1611–56), in revenge for this spoliation, allied himself to Austria, and conquered Upper and Lower Lusatia and Silesia. Subsequently the good understanding between these powers was destroyed, and the elector allied himself with Gustavus Adolphus (1631), and took part in the Thirty Years' war. But on the death of Gustavus, the elector separated from the Swedes, and made a separate peace (1635) with Austria, by which he obtained Upper and Lower Lusatia, acquisitions confirmed by the general treaty of Westphalia (1648). This was the period of the electorate's greatest power.—His sons, JOHN GEORGE II. (ruled 1656–80), August, Christian, and Maurice, divided the estates, the three latter founding cadet lines, all of which became extinct before 1750.—The lives of his successors, JOHN GEORGE III. (ruled 1680–91) and JOHN GEORGE IV. (ruled 1691–94), are unimportant; but FREDERICK AUGUSTUS I. (or II.) (ruled 1694–1733) nearly ruined the hitherto prosperous

electorate. Frederick Augustus had been chosen king of Poland; and his attempt, in company with the czar and the king of Denmark, to dismember Sweden, brought upon him and his two states the vengeance of the northern 'fire-king.' Poland was utterly devastated, and S. exhausted of money and troops. Besides, the king's habits were most extravagant; and to maintain his lavish magnificence, he was forced to sell important portions of territory.—FREDERICK AUGUSTUS II. (or III.) (ruled 1733–63), also king of Poland, took part in the war of the Austrian Succession (q.v.) against Maria Theresa; but finding the treaty of Berlin (1742) not so satisfactory for himself as he expected, he joined the empress 1745. The country was atrociously ravaged during the Seven Years' War (q.v.), and a long time elapsed before it recovered its peace and prosperity. —FREDERICK CHRISTIAN (ruled 1763) and FREDERICK AUGUSTUS I. (ruled 1763–1827, king from 1806), labored zealously for the good of their subjects; and under the long reign of the latter, agricultural, manufacturing, and industrial enterprise rapidly advanced. In spite of his love for peace the elector was led into the quarrel respecting the Bavarian Succession (q.v.); but he refused the crown of Poland 1791, and declined to take part in the convention of Pillnitz, though he joined the Prussian confederation of German princes, and had an army of 22,000 Saxons at the battle of Jena. But the pressure of the French compelled him to join the Confederation of the Rhine 1806, and from this time his army fought side by side with the French. He obtained the union to S. of the duchy of Warsaw (see POLAND); but fearing that the disasters of the French, 1812, would be fatal to their supremacy and to the interests of S., he withdrew to Bavaria, and thence to Prague, renounced the duchy of Warsaw, and made every attempt to come to amicable terms with the allies. But he was again compelled to join the French, between the battle of Lutzen (1813, May 2) and that of Leipzig (Oct. 16–19), after which he became prisoner of the allies, and his army was joined to theirs. For his support of Napoleon, he was deprived of the greater portion of S., which was handed over to Prussia, but he retained the title King, conferred on him 1806. The rest of his reign was occupied with internal reforms.—ANTONY (reigned 1827–36) reformed the entire legislation of the country, and granted a liberal constitution, being urged thereto by a popular outbreak in the autumn of 1831. The constitution was proclaimed 1831, Sep. 4; and the state's representatives first assembled 1833, Jan. 27.—His nephew, FREDERICK AUGUSTUS II. (reigned 1836–54), who had been regent for several years, succeeded him, and, though favorable to constitutionalism, he was unable to obtain the smooth and harmonious working of the new system. In 1843 violent contests began, accompanied by occasional riots in the principal towns, on the subject of the liberty of the press, and the publicity of legal proceedings. Sometimes the constitutionalists, sometimes their opponents, gained supremacy, and for a long time the two parties counteracted each other. Toward

the close of the king's reign, he was a mere tool in the hands of the reactionary party, headed by his brother JOHN, who succeeded 1854. John, however, supported constitutionalism, and established courts of justice throughout the kingdom. For the hostile attitude assumed by Saxony toward Prussia before 1866, and for its subsequent history, see GERMANY.

SAXONY, *săks'o-nĭ*, PRUSSIAN: most westerly undetached province of Prussia; bounded e. and n.e. by the province of Brandenburg; 9,751 sq.m. Pop. (1880) 2,312,007; of whom, Protestant 2,154,663, Roman Catholic 145,518, Jews 6,700; (1900) 2,832,616. The w. districts are occupied by the Harz Mountains, and the peak of the Brocken (3,738 feet high) is the chief elevation. The greater portion of the surface, however, is level, and slopes toward the n., in which direction flow the principal rivers—the Elbe, with its tributaries Saale and Mulde. The climate is mild and healthful, and the soil very fertile and well cultivated. More than half of the area is under crop, and nearly $\frac{2}{5}$ uncultivated, and in water and wood. The *Goldene Aue,* in the s.w., is especially famous for fertility. Manufacturing industry is very active, and there are spinning, weaving and oil mills in great numbers. The capital is Magdeburg (q.v.). The larger portion of Prussian Saxony (7,911 sq.m.) was detached from the kingdom of Saxony, and ceded to Prussia, by decree of the Congress of Vienna, 1815.

SAXTON, *săks'ton,* JOSEPH: 1799, Mar. 22—1873, Oct. 26; b. Huntingdon, Pa. After attending the common schools, he served an apprenticeship at watch-making, showed great mechanical ingenuity, removed to Philadelphia 1817, studied drawing and engraving, invented a machine for cutting the teeth of watch-wheels, made improvements in the construction of clocks, and made a clock which for a long time was in the tower of Independence Hall. He was in England 1828-37, became acquainted with Faraday and other noted scientists, made several important inventions, including a locomotive differential pulley, was offered the charge of the machinery used for printing the Bank of England notes, but returned to the United States to take an important position in the Mint at Philadelphia. He had charge of constructing the weights and measures to be used by the states for maintaining a uniform standard, and of the balances used in testing the standard weights of the country.

SAX'TON, RUFUS: soldier: b. Greenfield, Mass., 1824, Oct. 19; d. Washington, D. C., 1908, Feb. 23. He studied at Deerfield Academy, graduated from West Point 1849, was employed with a surveying party in the Rocky Mountain region 1853-4 and in the coast survey 1855-59, in the latter year was appointed instructor at West Point, and was afterward acting quartermaster under Gen. Lyon at St. Louis. In the civil war he was in West Virginia with Gen. McClellan, quartermaster at Port Royal

with Gen. Thomas W. Sherman, was for a short time in command at Harper's Ferry, was milit.gov. of the dept. of the south 1862–65, quartermaster with rank of major 1866, and was stationed at Louisville in control of the Jeffersonville dept. 1883–88. He was promoted brig.gen. of vols. 1862, brevetted brig.gen. U. S. army 1865, became lieut.col. and deputy quartermaster-gen. 1872, and 10 years afterward was made col. and assistant quartermaster-general.

SAY, v. *sā* [AS. *secgan;* Icel. *segia;* Ger. *sagen*, to say], to speak in words; to declare; to tell; to state; to answer or reply; to pronounce and not sing; to repeat: N. speech; what one has to say: IMPERA. tell me; speak. SAY'ING, imp., N. something said or declared; a proverbial expression. SAID, pp. pt. *sĕd*, did say. SAYER, n. *sā'ĕr*, one who says. IT IS SAID, or THEY SAY, it is commonly reported; people assert or maintain. HE SAYS, *sĕz*, his opinion is this; it is reported by him. THAT IS TO SAY, in other words; otherwise.—SYN. of 'say, v.': to speak; tell; utter; allege; repeat; rehearse; pronounce; relate; declare; recite; announce;—of 'saying, n.': proverb; aphorism; apothegm; axiom; maxim; byword; saw; adage; truism; principle; declaration; speech.

SAY, n. *sā* [OF. *saie*—from mid. L. *sagum*, a kind of cloth—from L. *sagum;* Gr. *sagos*, a coarse cloak]: in *OE.*, a kind of serge; silk. SAIES, n. plu. *sāz*, in *OE.*, different kinds of *say*.

SAY, n. *sā:* in *OE.*, for *assay*, which see: in the OE. phrase *to taste the say*—that is, to taste the wine before it is presented—*say* = *assay*, to try, to prove.

SAY, *sā*, JEAN BAPTISTE: French economist: 1767, Jan. 5—1832, Nov. 16; b. Lyon. Being intended by his father for a commercial career, he passed a part of his youth in England; and on his return to France obtained a situation in a life insurance co., about which time he made his first acquaintance with the works of Adam Smith. During the Revolution, he was for a time sec. to Clavière, minister of finance; and 1794 to 1800 edited a journal, *La Décade*, in which he expounded with great effect the views of Smith. Already S. had acquired reputation as a clear and forcible writer by his *Traité d'Economie Politique, ou Simple Exposé de la Manière dont se forment, se distribuent et se consomment les Richesses* (Par. 1803), and other works. Called to the tribunate 1799, Nov., he was not slow to express his disapprobation of the arbitrary tendencies of the new consular govt., and 1804 he ceased to be a member of a body that had become a mere tool in the hands of Bonaparte. Under the despotism of the empire, S. was forced into private life, and betook himself to industrial pursuits, establishing (with his son) at Auchy a large spinning-mill, which soon employed 500 workmen; and when Bonaparte fell, S. found himself at the head of the economical and commercial movement that marked the epoch. In 1814 the second ed. of his now celebrated *Traité* appeared, dedicated to Emperor

Alexander, who had long called himself his 'pupil;' and in the same year the French govt. sent him to England to study the economical condition of that country. In 1819, a new chair, of *Économie Industrielle*, was created for him at the *Conservatoire des Arts et Métiers;* and S. added to his influence and his popularity by the lucidity, grace, and intensity of conviction evinced in his lectures. In 1831 he was appointed prof. of polit. economy at the *Collége de France*, but died the following year. Although strictly a follower of Adam Smith, S. is an independent thinker. Ricardo speaks of his works as containing 'several accurate, original, and profound discussions.' He was the first to teach Frenchmen to consider rationally such questions as customs-duties, the currency, public credit, the colonies, and taxation; though the brilliant socialistic theorizers say that he is not an *économiste spiritualiste.* He is open to criticism, as are so many other economists, for a tendency to consider the *material* elements as almost solely constituting social science. The moral forces are not prominently regarded; government he seeks to reduce to its lowest terms and its most limited sphere—showing almost a desire to eliminate it altogether. Thus, his philosophy lacks breadth and strength. But on many practical points, e.g., the relations of capital to production, his suggestions have had great value. Besides his *chef-d'œuvre* above mentioned, S. wrote (among other works): *De l'Angleterre et des Anglais* (Par. 1812); *Catéchisme d'Économie Politique* (Par. 1815); *Lettres à Malthus* (Par. 1820); *Cours Complet d'Économie Politique* (Par. 1828–30); and *Mélanges et Correspondance* (Par. 1833). His principal writings form vols. 9–12 in Guillaumin's *Collection des Économistes.*

SAY, Jean Baptiste Léon: financier and economist: b. Paris, 1826, June 6; grandson of Jean Baptiste S., political economist. At an early age he contributed articles on economic questions to the *Journal des Débats*, of which journal he became principal owner. Under the empire, S. bitterly attacked the financial administration of Baron Haussmann, prefect of the Seine. He heartily approved the republic after the fall of Emperor Napoleon III., and during the siege of Paris was active, as administrator of the railroads of the north, in provisioning the city. He was elected to the national assembly 1871, and the same year was appointed prefect of the Seine. He was minister of finance under Thiers 1872–3, and repeatedly afterward held the same post in the administrations of Dufaure, Jules Simon, Waddington, and Freycinet. He was senator 1875–89; appointed ambassador to negotiate a treaty of commerce with England 1880, April; but in May was chosen pres. of the senate. After the founding of the republic, he acted with the left centre, or moderate republicans. His writings on financial subjects are regarded as of very high authority: among his published works are: *Theory of Foreign Exchanges* (transl. into English); *Le Socialisme d'État; Les Finances de la France.* He is member of the French Academy. He d. 1896, Apr. 21.

SAYBROOK, *sā'brūk:* town, Middlesex co., Conn., where the Connecticut river empties into Long Island Sound; on the Shore Line, and the Valley divisions of the New York New Haven and Hartford railroad; 32 m. e. of New Haven, 19 m. w. of New London. It was the original seat of Yale College 1701–07, and the place where the famous Saybrook Platform (q.v.) of the Congl. churches was framed 1708. Seabury Institute (Prot. Episc.) is located here. The town is a noted summer-resort. There are several small villages. Pop. (1900) 1,431; (1910) 1,907.

SAY'BROOK PLATFORM: system of faith and discipline adopted at a synod of Congl. churches convened at Saybrook, Conn., 1708, by order of the colonial legislature, and with special purpose to unite and strengthen the churches. It consisted of the Savoy Confession (q.v.), the Heads of Agreement adopted by the Presbyterians and Congregationalists of England, and certain Articles for the Administration of Church Discipline, the chief features of which were consociations of pastors and churches, associations of ministers, and standing councils. Though no authority existed to impose this platform as law, the Conn. churches largely conformed to its plan of organization, which, in form, has become entirely obsolete by the general adoption of the so-called conference system, bringing pastors and people together in district conferences, which are represented in annual state conferences, and these in a triennial national council. Where ministerial associations exist, they assume the character of professional gatherings simply.—The S. P. shows some mixed tendencies: in a few points it looks toward a polity and a doctrine less simple and less free than accord with the recognized principles of Congregationalism. Such elements—the product of a confused and unsettled time—have been gradually and quietly, but fully, discarded.

SAYCE, *sās*, ARCHIBALD HENRY, D.D., LL.D.: philologist: b. near Bristol, Eng., 1846, Sep. 25. He became scholar of Queen's Coll., Oxford, 1865, fellow 1869, tutor 1870; and was ordained priest 1871. He was deputy prof. of comparative philol. 1876–90, when he resigned. S. is among the foremost of living philologists, orientalists, and antiquarians. His published works are very numerous, and he is a frequent contributor to literary journals. Among his writings are: *Outlines of Accadian Grammar; Assyrian Grammar; Astron. and Astrol. of the Babylonians; Karian Inscriptions; Introduction to Science of Language; Anc. Empires of the East; Life and Times of Isaiah; The Hittites; Fresh Light from the Anc. Monuments.*

SAYRE, *sär*, STEPHEN: 1734–1818, Sep. 27; b. on Long Island, N. Y. He graduated from Princeton College 1757, entered mercantile and banking business in England, was prominent in political affairs, and was sheriff of London 1774. His expressions of sympathy with the Amer. colonies led to his commitment to the Tower on a charge of high treason, and to the loss of his fortune. On his release, he came to this country, was private sec. of Benjamin

Franklin, and afterward presented, with great success, the cause of the colonies in various European cities. He died in Virginia.

SAYRE: Pa.; borough in Bradford co.; on the North Branch of the Susquehanna river, and on the Lehigh Valley railroad; about 15 m. n. of Towanda, the capital of the county, and 18 m. s.e. of Elmira, N. Y. Sayre is in an agricultural region and near the coal fields of the state. The industries are connected chiefly with farm and dairy products. The chief industrial establishments are machine shops, stove fixture works, metal works, lumber and coal yards. There is considerable trade in the shipment of farm and dairy products and poultry. The borough has a high school, elementary schools, and a public library. Pop. (1910) 6,426.

SAYULA: Mexico; a town in the state of Jalisco, situated 55 m. s. of Guadalajara. Agave and sugar are cultivated in the surrounding country, and the town has a thriving commerce. Pop. 10,655.

SBARETTI, DONATUS: Italian Roman Catholic prelate: b. Montefranco, Italy, 1856, Nov. 12. He was educated at the College of Saint Apollinaris, Rome, and was ordained in 1879. For eight years after his ordination he occupied the chair of speculative and moral philosophy in the College of the Propaganda, Rome, and subsequently served as sub-secretary of the Propaganda in affairs concerning the United States. He was made private chamberlain to Leo XIII., with title of Monsignore, and in 1893-1900 was the first to occupy the office of auditor of the Apostolic Legation at Washington. He was consecrated bishop of Havana in 1900, appointed extraordinary Apostolic Delegate to the Philippines in 1901, titular archbishop of Ephesus later in that year, and since 1902 has been Delegate Apostolic to Canada.

SCAB, n. *skăb* [L. *scabĭēs;* It. *scabbia;* Dan. and Sw. *skab;* Ger. *schabe,* scab, scurf: Dut. *schabben,* to rub, to scratch; Bret. *skraba,* to scratch]: crust formed over a sore in healing; a disease in sheep resembling itch, or mange (see below): V. to become covered with a scab; to grow scabby. SCAB'BING, imp.: N. a flaw in metal-castings caused by sand rising up through the hot metal to the surface. SCABBED, pp. *skăbd:* ADJ. abounding with scabs; mean; paltry. SCABBEDNESS, n. *skăb'bĕd-nĕs,* the state of being scabbed. SCAB'BY, a. *-bĭ,* covered or affected with scabs; vile; mean. SCAB'BINESS, n. *-bĭ-nĕs,* the state or quality of being scabby. SCAB'BILY, ad. *-lĭ.* SCABIES, n. *skā'bĭ-ēz* [L.]: the scientific name for the itch. SCA'BIOUS, a. *-ŭs,* or SCA'BIOSE, a. *-ōs,* scabby; itchy; consisting of scabs. SCA'BIOUS, n. a plant of the genus *Scabiōsă,* ord. *Dip'sacācĕæ.*

SCAB, or SCABIES: a skin disease in sheep, analogous to the itch in the human subject and to mange in horses and dogs. See ITCH.

SCAB BARD-FISH (*Lepidopus caudatus*): fish of long, compressed form and silvery lustre, found on the coasts of Europe and the Gulf of California; also in New Zealand, where it is called the Frost-fish, and esteemed as food. It is much like another species, *Trichiurus lepturus*, the Cutlass-fish, known in Fla. by the pre-occupied name Sword-fish, in New Orleans and Ga. as the Silver-eel, in Texas as the Sabre-fish, and found as far n. rarely as Salem, Mass., and s. to Brazil; it is ordinarily 25–30 in. long, but in the W. Indies 4–5 ft. By some it is thought to be identical with *T. haumela* of the Indian Ocean and the Pacific.

SCABBLE, v. *skăb'l* [etym. doubtful]: to dress, as a stone, with a fine ax or broad chisel.

SCABELLUM, n. *skā-bĕl'ŭm*, SCABELLA, n. pl. *la* [L. dim. of *scamnum*, a bench, a footstool]: ancient musical instrument of the nature of a castanet, fastened to the foot, and struck together by it as a rhythmical accompaniment to other music; kind of pedestal to support busts.

SCA'BIES: see ITCH.

SCABIOUS, *skā'bĭ-ŭs* (*Scabiosa*): extensive genus of herbaceous plants, exclusively natives of the e. hemisphere; of the nat. order *Dipsacaceæ*. See TEASEL. The flowers are collected in terminal heads, surrounded by a many-leaved involucre, like those of the order *Compositæ*. The DEVIL'S-BIT S. (*S. succisa*) has great astringency, but no important medicinal virtues, though it was formerly supposed efficacious in all scaly eruptions—hence the name S., from Lat. *scabies*, leprosy. The end of the root appears as if abruptly bitten off, and the superstition of the middle ages regarded it as bitten off by the devil, in anger at its usefulness to mankind. The SWEET S. (*S. atropurpurea*) is a fragrant garden-flower, supposed native of India; it is known in American gardens as the Mourning Bride.

SCABROUS, a. *skā'brŭs* [F. *scabreux*, scabrous—from mid. L. *scabrōsus;* L. *scaber*, rough—from *scabo*, I scratch. It. *scabroso*]: in *bot.*, rough, having the surface rough to the touch, arising from a covering of very stiff short hairs scarcely visible; harsh. SCA'BROUSLY, ad. *-lĭ*. SCA'BROUSNESS, n. *-nĕs*, state or quality of being scabrous; roughness.

SCAD, n. *skad* [AS. *sceadda*, a kind of fish. Gael. *sgadan*, a herring]. (*Trachurus saurus*): carangoid fish, sometimes called *Horse Mackerel*, because of its resemblance to the mackerel, and its comparative coarseness. It is 12 to 16 inches long, of dusky olive color, changing to resplendent green, waved with a bluish gloss, head and lower parts silvery, throat black. There are two small free spines in front of the anal fin. The species of this genus are very numerous, and the name S. is applied to any of them. It is common on s.w. coasts of England, sometimes appearing in immense shoals, pursuing the fry of herring or similar prey, and the multitudes have sometimes been so great and so crowded together, that they could be lifted out of the sea by buckets, and overloaded nets have been torn

to pieces by them. The S. has something of the mackerel flavor. Although not much cared for when fresh, it is often salted, and in that state is esteemed as an article of food. It is rare on the s. Atlantic and the Pacific coasts of N. America.—In England, S. appears to have been a name also for the Shad: in Scotland, it sometimes denotes the Ray.

Scad (*Caranx trachurus*).

SCAFELL, *skaw'fĕl:* double-peaked mountain in Cumberland, England, on the Westmoreland border, 13 m. s.s.w. of Keswick; a chief feature in the scenery of the Lake Country, in the heart of which it stands. Of its two peaks, the higher rises 3,229 ft., the other 3,092 feet.

SCAFFOLD, n. *skăf'fōld* [OF. *escafaut;* Sp. and It. *catafalco;* Prov. *cadafalc*, a scaffold—from Prov. and O.Sp. *catar* (L. *captārĕ*, to strive after, to observe), to look, to see, and It. *palco*, a stage]. a gallery, stage, or platform of timber for a temporary purpose, as in building; an erection for an execution: V. to furnish as with a scaffold; to sustain; to support. SCAF FOLDING, imp.: N. the erection of timber-work, usually supported on upright poles, for the use of workmen in carrying on building operations; the materials; that which sustains. SCAF'FOLDED, pp. BROUGHT TO THE SCAFFOLD, put to death or executed.

SCAGLIA, n. *skăl'yă* [It. *scaglia*, a scale, a chip of marble or stone]: reddish variety of chalk, an Italian calcareous rock containing nodules and layers of flint. SCAGLIOLA, n. *skăl-yō'lă* [It *scagliuola*]: composition of gypsum, Flanders glue, isinglass, etc., colored with any of the earthy and sometimes with the chemical colors, to resemble the natural *scaglia* limestone, and in successful imitation of the more costly kinds of marble. It is spread as a plaster over the surface intended to represent marble; and while still soft, pieces of fibrous gypsum, marble, alabaster, and other soft but ornamental stones, are pressed into it, and made level with the surface. When the composition is set hard, it is rubbed down, and polished wtth the ordinary stone-polishing materials, which give it a very fine gloss. This kind of work is only for interiors, because scagliola will not bear long exposure to damp; but its lightness and ease of application to walls, pillars, pilasters, and even cornices, make it a useful decoration.

SCALA, *skâ'lâ*, DELLA: prominent Italian family which ruled Verona 1260–1389. The dynasty was founded by Mastino I., who died by violence 19 years later. The wisest and best representative of the house was Can Grande (d. 1329), friend and patron of Dante. In the early part of the rule of this family Verona increased in size and power, and the arts were in a flourishing condition; but toward its close, owing to war with neighboring cities and the inefficiency of the rulers, it greatly declined.

SCALADE n. *skă-lād'*, or SCALADO, n. *skă-lā'dō;* usual spelling ESCALADE, which see.

SCALA NOVA, *skâ'lâ nō'vâ*, or SCA'LA NUO'VA, or NEW EPH'ESUS: seaport of Asiatic Turkey, on an eminence at the head of the Gulf of S. N., 40 m. s. of Smyrna. The ruins of the ancient city of Ephesus (q.v.) are in the vicinity. An important export-trade is carried on. The Gulf of S. N., confined on the s. by the island of Samos, is 40 m. long and about 20 m. broad.—Pop. estimated 7,000 to 10,000.

SCALAR, a. *skā'lĕr* [L. *scalaris*, pertaining to a flight of steps]: in *philos.* (of a quantity), not involving direction, as the volume of a figure or the mass of a body.

SCALARIFORM, a. *skă-lăr'ĭ-fawrm* [L. *scalāris*, ladder-like—from *scala*, a ladder; *forma*, a shape]: ladder-shaped: in *bot.*, applied to vessels showing a ladder-like pattern, as seen in ferns.

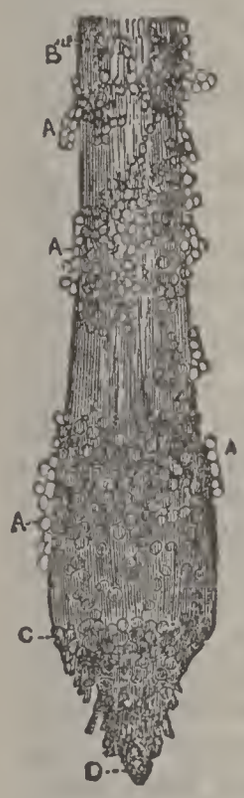
SCALD, n. *skawld* [It. *scaldare;* F. *échauder*, to heat, to warm—from mid. L. *excaldārĕ*, to wash in warm water —from L. *ex*, out, very; *calĭdus*, hot: Dan *skolde;* Sw. *skolla;* Gael. *sgall*, to scald]: injury to the body caused by hot water or other hot liquid (see BURNS): V. to painfully affect and injure the body by a hot liquid; to expose to the action of boiling water. SCALD'ING, imp.: ADJ. burning, as with a hot liquid; in *OE.*, hot; drying. SCALD'ED, pp. SCALDING-HOT, hot enough to scald. SCALDED CREAM, cream raised from milk by heat.

SCALD, a. *skawld* [see SCALL]: scabby; in *OE.*, paltry; sorry: N. in *OE.*, scurf on the head: see SCALL. SCALD-HEAD, (see RINGWORM: also SCALD-HEAD).

SCALD, or SKALD, n. *skăld* or *skawld* [Icel. *skald:* Dan. *skiald:* Ger. *skalde;* allied to *skill*—radical sense being to separate, thence to discern]: one of the anc. Scand. poets; among the *Norsemen*, a reciter and singer of poems, generally heroic—also spelled *scalder*, or *skalder*. SCALDA, or SKALDA, that part of the second Icelandic or old Norse Edda which treats of the art of poetry. SCALD'IC, a. *-ĭk*, pertaining to the anc. Scand. scalds or poets.—*Scald* was the name given specially to that class of poets who exercised their art (*Skálldskapr*) as a vocation requiring a learned education; i.e., knowledge of the construction of verse, and of the enigmatical imagery roughly shaped out of obscure tradition, to which Scandinavian poets were prone. The great, if not the only aim of the Scaldic poetry was to celebrate the deeds of living warriors or of their ancestors. For this reason, princes attached Scalds to their courts, and

competed with each other, by munificent presents, for possession of the most skilful minstrels. Very few complete Scaldic poems are extant; but, on the other hand, the multitude of fragments preserved, partly in the younger Edda, partly in the Sagas, and the Heimskringla, is very great. A manuscript of the younger Edda, belonging to the University of Upsala (printed in *Historia Literaria Islandica* of Einarsen), contains a list of the most celebrated Icelandic and Norwegian Scalds of the 13th century, under the name *Skálldatal.* The songs relating to the religious and heroic traditions of the North, found in the Edda, go back to an earlier time, in which the class or school of 'Scalds,' properly so called, did not yet exist. The authorship of these primitive Eddaic songs is unknown; but they are the sources from which the 'Scalds' of later times drew much of their inspiration.

SCALD-HEAD [corruption probably of *Scaled Head*]: popular name of a fungus parasitic disease of the scalp (and occasionally of the face and other parts), known in medical phraseology as *Favus, Tinea favosa,* and *Porrigo scutulata.* The primary seat of the parasite is in the lowest portion of the hair-follicles, outside the layer of epithelium which covers the root of the hair. The plant is, however, often found in cup-shaped depressions on the surface of the scalp, forming the yellow honeycomb-like masses which suggested the specific name *Favus* (honeycomb) for the disease. The honeycomb crust increases, preserving its circular form and depressed centre, till it occasionally reaches a diameter of nearly half an inch. These crusts commonly appear in crops, and may be either distinct or confluent. The smell of the scab is peculiar, and has been compared to that of a cage in which mice have been kept. The scab sometimes resembles a lupine, or a minute shield, rather than the cell of the honeycomb; hence the varieties of scald-head which have been described under the name *Porrigo lupinosa* and *Porrigo scutulata.*



Scald-head:

A, A, chains of sporules projecting beyond the edges of the hair; B, sporules between the fibres of the hair; C. D. broken-up root end of hair, with masses of sporules between the laminæ.

The aim of treatment is to destroy the parasite. For this purpose, the hair should be cut close, and poultices then applied till the scabs are removed. Tar-ointment may then be applied, night and morning, the old ointment being washed off with soft soap and water before the fresh dose is laid on. In the early stage of the disease, in place of the preceding treatment, it is sometimes sufficient to cut the hair close, and to

wash the affected parts, night and morning, with oil of turpentine. If the disease does not yield to these applications, the treatment for RINGWORM (q.v.) may be tried.

SCALE, n. *skāl* [Dut. *schæle,* bark, crust; *schelle,* bark, skin: Dan. and Sw. *skal,* a shell: Ger. *schale,* a shell, a dish: Gael. *sgil,* to shell, to unhusk]: bark or crust; one of the thin plates that form the covering of many fish (see SCALES OF FISHES) and of serpents; any thin layer that can be separated; a lamina; the dish of a balance: V. to take off in thin pieces or layers; to pare the surface from; to peel off in scales; to weigh in a scale. SCA'LING, imp. SCALED, pp. *skāld:* ADJ. having scales like fishes. SCALER, n. *skā'lėr,* one who scales. SCA'LY, a. *-lĭ,* abounding with scales; composed of scales lying over one another. SCALE'LESS, a. *-lĕs,* destitute of scales. SCALE-BOARD, n. usually pronounced *skăb'ėrd,* a thin veneer of wood used to cover the surfaces of articles of furniture and the like. SCALES, n. plu. *skālz,* a balanced beam from whose extremities are suspended two dishes or saucers; a balance; in *bot.,* rudimentary or metamorphosed leaves. SCALE-FERN, a fern so called from the scales at the back of the fronds. SCALE-INSECT. See COCCUS.

SCALE, n. *skāl* [L. *scala,* a ladder—from *scando,* I climb: F. *échelle;* OF. *eschele,* a ladder: It. *scala,* a ladder]: series of steps; anything marked in parts at equal distances; a graduated line to show distances as compared with a map; an instrument graduated or divided into parts, used for mathematical and philosophical purposes; a natural series of musical sounds (see SCALE, MUSICAL); a regular gradation; the natural order of progression on which any system of notation is based (see SCALES OF NOTATION): in *OE.,* act of storming by ladders: V. to ascend or climb a rocky precipice, as by a ladder. SCA'LING, imp. SCALED, pp. *skāld.* SCA'LABLE, a. *-lă-bl,* that may be scaled. SCALING-LADDER, a ladder used in time of war for mounting over the walls, etc., of a fortified place, made in parts 7½ and 12 ft. long, and joined by placing the end of one into the socket of the other. THE SCALE OF AN INSTRUMENT, its compass. DIATONIC SCALE, the musical ladder of graduated steps and half-steps, or tones and semitones, containing five of the former and two of the latter. CHROMATIC SCALE, the musical ladder graduated by half steps or semitones (see SCALE, MUSICAL).

SCALE INSECTS: certain species of the family *Coccidæ* (see COCCUS). Some species of this family are popularly called mealy bugs more often than scales; such species are readily distinguished by being free-moving, whereas the scales are stationary except for a few hours after birth or hatching. The males of the family are remarkable in having a complete metamorphosis (other *Hemiptera* have incomplete, and so do the females of this family), one pair of wings, a pair of hooks replac-

ing the rear wings, and an extra pair of eyes in the adult, instead of mouth-parts. The female has six legs when newly hatched, but after molting the legs are wanting and the insects are grub-like, stationary, wingless, and are concealed beneath a powdery, cottony, or waxy secretion and the cast-off skins. On account of their appearance some of the species are called gall insects, a name more correctly applied to species of the family *Cynipidæ* and *Gallicolæ,* which produce nut-galls or galls.

The family embraces several species which have been used by man for many centuries and also some that are regarded as troublesome upon cultivated plants. The scarlet grains of Poland are scale insects (*Coccus polonicus*) which are found on the roots of knawel and were formerly an important article of commerce, being used in dyeing various fabrics. Another species found on the roots of burnet has long been used by the Moors for dyeing wool and silk various tints of pink. Kermes or scarlet grain is the dried body of *Lecanium ilicis* which lives on the young shoots of the kermes oak (*Quercus coccifera*), a low evergreen shrub common from Spain eastward to India. In parts of this region this insect furnished a source of revenue to the people. The females grow about as large as peas and before the eggs are hatched, during May, they are gathered, dropped into vinegar, dried in the sun or in ovens, and sold. They have been used for ages to dye cloth a dark brownish-red, but except locally they are almost entirely superseded by cochineal, which is a species of the mealy bug group. Several other species have been used for dyeing, some being employed by the ancient Egyptians, Jews, and Persians for giving the brilliancy or delicacy of tint to certain fabrics formerly highly valued by these nations and the peoples embraced in their commerce.

Other members of the family are noted for their wax, which is used in some countries for candles, varnishes, sealing wax, lacquer, and many other purposes. The wax insect of China (*Coccus sinensis*) is a small white species which lives upon sumac and other trees upon the branches of which it deposits its secretion. This resembles hoar frost during June, but becomes somewhat darker and more continuous by August when it is scraped off and melted in boiling water. After straining and cooling it is ready for use. The French have introduced this species into Algeria. In South America another species is locally, but not commercially, important as a source of wax and in other countries are several species that might become similarly useful. But the principal species are the lac or shell-lac insects of Asia.

Among the species considered troublesome upon cultivated plants perhaps the cottony cushion scale (*Icerya purchasi*) is the most noted in the United States. This is an Australian insect which was accidentally introduced into California where, being free from the condi-

tions that held it under control in its native habitat it spread rapidly upon orange, lemon, and other citrus trees to the dismay of the orchardist. It was found that certain species of lady-bird beetles play important rôles in checking the spread of this scale in Australia; and so, some were imported in the hope that they would eradicate the scale in California. They did. The scale is now practically extinct in California and the lady-bird beetles, being deprived of their food supply, have followed it, since they seem to be unable to adapt themselves to other foods. This is one of the most remarkable instances of man's intervention to bring natural controls to his aid instead of resorting to artificial methods which are frequently cumbersome or unsatisfactory.

The San José scale (*Aspidiotus perniciosus*) is viviparous and enormously productive. It lives upon the woody members of the order *Rosaceæ,* for example, apple, cherry, rose, and pear, and upon currants, gooseberries, elm, chestnut, oak, walnut, and many other trees and shrubs. The scurfy scale (*Chionaspis furfurus*) is an oval scale with the cast skin at the small end and is frequently found upon apple and pear trees. The red scale of the orange is a close relative of the San José scale and is well known in California, Florida, etc.

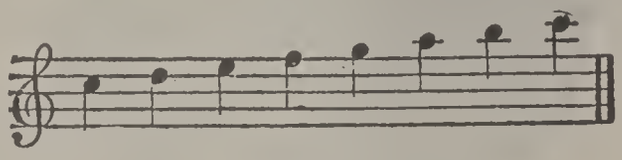
The cottony maple scale (*Pulvinaria innumerabilis*) is often found on Virginia creeper, grape vines, and some other plants, as well as on maples. It is a soft scale which is usually rather conspicuous in spring from its cottony appearance upon the young growths. The 'cotton' is really a gum since it can be drawn out into cobweb-like threads. The black scale (*Lecanium oleæ*) is another soft scale which is well known to California olive and orange growers.

Several species of scale insects are found in greenhouses and nurseries devoted to ornamental plants. But they present no more remarkable features in life-history or habits than the preceding, and being of somewhat smaller importance need not be discussed specifically.

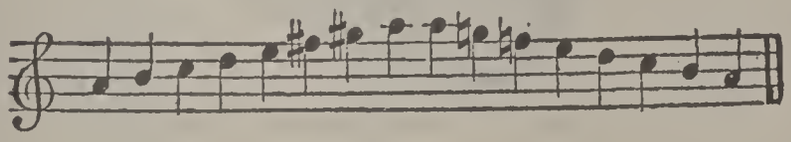
Where the natural controls seem to be inadequate to cope with the species various artificial methods have been tested to determine their efficacy. But in many instances these are so cumbersome, expensive, dangerous either to plant or operator, and difficult to apply intelligently, that they have been discarded. Spraying and fumigation are the principal ones in vogue. But it seems highly probable that in many instances the natural controls would hold the scales in check. Man has, however, not yet discovered these controls except in a few cases and in most of these has not made use of them more than experimentally. Consult: Smith, *Economic Entomology* (Philadelphia 1896); Comstock, *Manual for the Study of Insects* (Ithaca 1895); and bulletins of the agricultural experiment stations and the United States Department of Agriculture.

SCALE, MUSICAL: succession of notes arranged in the order of pitch, and comprising those sounds which may occur in a piece of music written in a given key. The ultimate criterion of what should constitute a musical scale is doubtless what gives most pleasure to a cultivated ear; but the sounds that please the ear are found to be those also that stand in certain simple mathematical relations to each other. Among the ancient Greeks, various different scales or *modes* were in use, of which six were generally enumerated—the Dorian, Phrygian, Lydian, Mixo-Lydian, Ionic, and Æolian. Excepting in the music of the Greek Church and of the Ambrosian Chant, modern musical feeling has rejected all of these but two, the Ionic and Æolian, the former of which is now known as the Major, and the latter the Minor Mode. In both modes, the S. consists of a series of seven steps leading from a given note, fixed on as the tonic or key-note, to its octave, which may be extended indefinitely up or down, so long as the sounds continue musical.

Major Mode.



Minor Mode.



For explanation of the principles on which these scales are founded, and of their derivation from the harmonic triad, see MUSIC. The major S. is derived from much simpler proportions than the minor. The minor S. requires to be modified by occasionally sharpening its sixth and seventh.

SCALE, or SKAIL, v. *skāl* [Icel. *skilia*, to separate: comp. Gael. *sgaoil*, to disperse]: in *Scot.*, to separate; to disperse; to scatter; to spill. SCA'LING, imp. SCALED, pp. *skāld*.

SCALE-ARMOR: small plates of steel riveted together in a manner resembling the scales of a fish. From the small size of the plates, it had considerable pliability, and was a favorite protection for the neck, in the form of a curtain hanging from the helmet. Scale-armor is obsolete, except, perhaps among some eastern potentates.

SCALENE, a. *skā-lēn'* [L. *scalēnus;* Gr. *skalēnos*, oblique, unequal]: in *geom.*, applied to a triangle having three unequal sides.

SCALENT, a. *skāl'ent:* in *geol.*, climbing; applied in the Appalachian strata to a series of rocks, equivalents of the Onondaga salt and water-lime groups of New York.

SCALES of Fishes: thin plates forming the covering of many fish. They are divided by Agassiz, whose classification is generally adopted, into the *placoid, ganoid, ctenoid,* and *cycloid* forms. *Placoid* scales [from Gr. *plax,* broad plate] lie side by side without overlapping or imbricating. They are often elevated at the centre to form a strong projecting point. All the cartilaginous fishes, except the sturgeon, have placoid scales. *Ganoid* scales [from Gr. *ganos,* splendor] are covered with a fine enamel, and generally of rhomboidal form and imbricated: the sturgeon and the bony pike (*Lepidosteus*) have scales of this nature, but the finest examples are found in fossil fishes. *Ctenoid* scales [from

Fig. 1.—Placoid Scale.

Fig. 2.—Cycloid Scale.

kteis, a comb] are generally of rounded or oval form, with teeth or projections on their posterior margin, devoid of enamel, and with imbricated arrangement: the perch and many osseous fishes possess these scales. *Cycloid* scales [from Gr. *kyklos,* circle] consist of concentric layers of horn or bone, without spinous margins, and not covered by enamel: they are soft and flexible, present a variety of linear markings on their upper surface, and usually have an imbricated arrangement: the carp, herring, salmon, etc., possess these scales. In many cases, two kinds of scales occur in the same fish; in other cases, the different species of a single genus have different kinds.

For anatomical details regarding the structure and mode of development of scales, see Prof. Huxley's article 'Tegumentary Organs' in *Cyclopædia of Anatomy and Physiology,* and Prof. Williamson's Memoirs in *Philosophical Transactions,* 1849–52. In chemical composition, the scales of fishes approximate to the bones, except that they contain more organic matter. The brilliancy of tint of many fishes is due apparently to the phenomena of optical interference, rather than to the presence of coloring matter. For figures of Ctenoid and Ganoid Scales, see CTENOID FISHES: GANOID.

SCALES OF NOTA'TION, in Arithmetic: the various systems of expressing numbers in terms of any given base or 'radix.' Thus, the number 289, in the decimal or common system whose radix is 10, signifies 9 units, 8 tens, and 2 hundreds, or $2 \times 10^2 + 8 \times 10 + 9$. To express the same number in the quinary scale, e.g., we must group the 289 units into multiples and powers of 5; an operation which may be performed in either of two ways, as follows:

5)289	289	2124 (quinary)
5)57–4	10	5
5)11–2–4	103 (taking in 8, and	11 (carrying by 10)
2–1–2–4	10 carrying by 5)	5
	2124	57
		5
		289

or 2124 (i.e., $2 \times 5^3 + 1 \times 5^2 + 2 \times 5 + 4$) in the quinary scale represents the same numerical quantity as 289 in the decimal scale. The following list shows the same numerical quantity according to the scales having for their radices the first 11 numbers after unity, and will partly indicate the advantages and disadvantages of each scale:

In the *binary*	(*radix* 2)	scale.....	100,100,001
" ternary	(" 3)	"	101,201
" quaternary	(" 4)	"	10,201
" quinary	(" 5)	"	2,124
" senary	(" 6)	"	1,201
" septenary	(" 7)	"	562
" octary	(" 8)	"	441
" nonary	(" 9)	"	351
" decimal	(" 10)	"	289
" undenary	(" 11)	"	243
" duodecimal	(" 12)	"	201

It will be observed that the binary scale possesses only two symbols, 0 and 1, the ternary has 3, while the undenary would require a symbol in addition to the 9 digits and zero to express 10, which is a digit in that scale, and the duodecimal scale two additional symbols for 10 and 11. A glance at the above table shows that if the binary scale had been in ordinary use, great facility in the 'performance' of arithmetical operations would have been obtained at the cost of largely increasing their 'extant,' and that both the advantage and disadvantage diminish as we raise the scale. The selection of 'ten' as the ordinary base is everywhere prevalent, and was evidently suggested by the number of fingers; but the scales of two, three, four, five, six, twenty and sixty have at various times been used by a few nations or tribes. The scale of 12 constantly occurs, especially in English weights and measures, as in dozen, gross, troy ounces, foot, shilling, etc., causing considerable complexity in calculation, as all abstract numerical calculation follows the decimal system. See NOTATION, METRIC SYSTEM.

SCALIGER, *skăl'ĭ-jĕr*, JOSEPH JUSTUS: most eminent scholar of modern times: 1540-1609, Jan. 21; b. Agen,

France, tenth son of J. C. Scaliger and Andietta de Roques-Lobejac, and much his father's superior in learning. At the age of 11, he was sent, with two of his brothers, to the college of Bordeaux, where for three years he studied Latin. A pestilence breaking out in the town, he was recalled by his father, who supplemented the scanty knowledge which his son brought home with him by making him write a Latin declamation every day on any subject that he chose. Under this training, he soon attained great proficiency as a Latinist, and in his 19th year, on the death of his father, he went to Paris and studied Greek under the famous Turnebus. He was less indebted, however, to any master than to himself; and finding that his progress was slow under his great preceptor, he closeted himself alone with Homer, and in 21 days read him through, with the aid of a Latin translation, and committed him to memory. In less than four months, he had mastered all the Greek poets. Next, Hebrew, Syriac, Persian, and the most of the modern European languages were mastered in rapid succession by his industry, while he was assiduous in composing verses both in Latin and in Greek. About this time, he declared that he could speak 13 languages, ancient and modern; and such was his ardor in study, that he allowed himself only a few hours' sleep at night, and would frequently pass whole days without rising from his books even for meals. In 1570 on invitation of Cujas he went to Valence, where he studied jurisprudence three years. His proficiency in literature, especially in the history, chronology, and antiquities of Greece and Rome, secured him, 1583, an honorable engagement from Louis de la Roche Pozay, French ambassador at the pontifical court. The year before, however, he had become a Protestant, which rendered it difficult for him to retain an appointment in France. Except that he travelled, at the generous instance of his patron, and visited the chief universities of France and Germany, and found his way to Scotland, little is known of his life 1565-93. In 1593 he complied with an invitation of the Dutch government, and went to fill the chair of literature, vacated by Lipsius in Leyden Univ., where he spent the residue of his days. His labor now consisted chiefly in interpreting and illustrating the classical authors. From his chair at Leyden he ruled the literary world of Europe as from a throne. Protestantism had the prestige of having on its side the chief of living scholars. But his latest years were embittered by the tremendous attack of the Jesuits' advocate Scioppius (q.v.) on Scaliger's family history and pedigree as set forth in a volume by Scaliger himself. Though full of calumnies and lies, the attack yet had on a few important points a crushing force. Scaliger was never married.—He far excelled his father in learning; but like him he was irritable and arrogant; also, he fully shared the paternal pride of pedigree. Though doubtless his belief in

the genuineness of his father's claim to be a prince of Verona was sincere, even if his father's had not been. His writings abound with expressions of hatred and contempt toward his opponents, and he has enriched the vocabulary of learned abuse to an extent almost proverbial. He was, however, a man of sincere motive and of honorable sentiment. Scaliger had immense intellectual vigor, and must be credited with having been the first to frame, in his treatise *De Emendatione Temporum* (Paris 1583), a complete system of chronology on fixed principles. It was this most learned achievement, and his invention of the Julian period, that secured for him the title Father of Chronological Science. It was subjected to much emendatory criticism by censors like Petavius, and also by himself, its errors having been partly corrected by him in his later work, *Thesaurus Temporum, complectens Eusebii Pamphili Chronicon cum Isagogicis Chronologiæ Canonibus* (Amst. 1658, 2 vols. fol.). Among the classical authors whom he criticised and annotated are Theocritus, Seneca (the tragedies), Varro, Ausonius, Catullus, Tibullus, Propertius, Manilius, and Festus. His other works are *De Tribus Sectis Judæorum; Dissertations on Subjects of Antiquity; Poemata; Epistolæ;* a translation into Latin of two centuries of Arabian proverbs, etc. He numbered among his friends the most illustrious scholars of the time, such as Lipsius, Casaubon, Grotius, Heinsius, the Dupuys, Saumaise, Vossius, Velser, P. Pithou; and interesting notices of him are preserved in such works as the *Huetiana,* and above all, in the two posthumous vols. of *Scaligerana,* which embody his conversations. See his Life by Bernays (Berl. 1855).

SCAL'IGER, JULIUS CÆSAR: one of the most famous men of letters that have appeared since the revival of learning: 1484-1558, Oct. 21. In after-life, he created for himself a noble pedigree, and made out that he was descended from the princely family of the Scalas of Verona (see SCALA, DELLA), and that his birthplace was the castle of Riva, on the banks of the Lago di Guarda. According to his own account, he was educated first under the famous Fra Giocondo; was attached as a page to his kinsman, Emperor Maximilian, whom he attended for 17 years in peace and war; was next made a pensioner of the Duke of Ferrara; thereafter studied at Bologna; commanded a troop of cavalry at Turin under the French viceroy; prosecuted his studies there in philology, philosophy, and medicine; and 1525 went to Angen, in France, with the bishop of that diocese, a member of the Rovere family, to whose household he became physician.—Tiraboschi's account, however, which is more probable, represents him as born at Padua; son of Benedict Bordoni, a geographer and illuminator of that city, who, either from the sign of his shop or the name of the street he lived in, assumed the surname of Della Scala. Till his 42d year, young Giulio Bordoni resided chiefly

in Venice or Padua, engaged in the study and practice of medicine, and appearing under his true name as an author. In 1525, he withdrew to Agen, either from some advantageous offer, or to promote his fortune, and there fixed his abode. He became physician to the bishop of the diocese; and sought in marriage Andietta de Roques-Lobejac, a young lady only 16 years of age, of noble and rich parentage. An obstacle was thrown in the way of this alliance; and probably with the purpose of lessening the disparity in station between himself and the object of his affections, he procured, 1528, letters of naturalization as a French subject, under the name of Jules-César de Lescalle de Bordonis. This was probably the occasion when he added Cæsar to his baptismal name Julius. The marriage took place 1529, and was a happy one. At his death he left a mass of publications on various subjects, and a reputation for extent and depth of learning beyond that of any other man of his day in Europe. He had vigor of understanding, keenness of observation, and extraordinary power of memory. As a thinker, he was more independent than sound; and as a man, was of violently irritable temper and excessive vanity. His best known publications are—*Commentarii in Hippocratis Librum de Insomniis* (Commentaries on the Hippocratic Treatise on Dreams); *De Causis Linguæ Latinæ Libri XVIII.*, celebrated as the first considerable work in Latin in modern times, and not without value even yet; Latin translation of Aristotle's *History of Animals;* his *Exercitationum Exotericarum liber quintus decimus de Subtilitate ad Hieronym. Cardanum;* his seven books of *Poetics* (also in Latin, and on the whole his best work); his *Commentaries on Aristotle and Theophrastus;* his two orations against Erasmus; his Latin poems, etc.

SCALL, n. *skawl* [Dut. *schelle,* bark, membrane: Dan. *skaldet,* bald, bare, callow: Icel. *skalli,* a bare head: comp. Gael. *sgall,* baldness, scab]: scurf in the head; a scurfy head; scabbiness; leprosy. SCALLED, a. *skawld,* scabby. SCALD- or SCALLED-HEAD. See SCALD-HEAD.

SCALLAWAG, n. *skăl'a-wăg* [etym. doubtful]: *colloquially,* a scamp; a scapegrace; a good-for-nothing fellow.

SCALLION, n. *skăl'yŭn* [It. *scalogno,* a shallot—*lit.,* the onion of *Ascalon*—from L. *Ascalōnĭus,* of or from *Ascalon,* in Palestine]: a plant, a kind of onion; the eschalot; the *Allĭŭm Ascalon'ĭcŭm mājus,* ord. *Lilĭăcĕæ.*

SCALLOP, n. *skŏl'lŏp* or *skăl'lŏp* [OF. *escalope;* O. Dut. *schelpe,* a shell; *schelpevis,* a shell-fish: comp. L. *scalpĕrĕ,* to scratch, to engrave]: a bivalve mollusk, ribbed and furrowed, found abundantly on the shores of Palestine; pilgrims wore the shell as a token of their visit to the Holy Land; the pecten or clam, a kind of dish for baking oysters in. SCAL'LOP, n. for ESCAL'LOP (q.v.), in *her.,* a species of shell, the mark of a pilgrim;

and symbol of the apostle James the Greater (see PECTEN). SCAL'LOP, v. for ESCAL'LOP, v. to mark or cut the border of a thing into segments of a circle. SCAL'LOPING, imp. SCAL'LOPED, pp. *-lŏpt:* ADJ. having the edge or border marked with segments of circles. SCALLOP-OYSTERS, opened oysters cooked with crumbs of bread.

SCALLOP: a well known bivalve mollusk. The scallops form a family (*Pectinidæ*) related to the oysters, which they resemble in having a single adductor muscle. The genus *Pecten*, which in the wide sense is nearly coextensive with the family, has the following characters: The shells are more or less orbicular, with an ear developed on each side of the umbo, making a straight hinge-line, generally ornamented externally with more or less developed radiating ribs. The hinge-teeth are lamellar, but usually small and obscure; the principal ligament is internal and solid, and the muscle-scar is single. The mantle margins are open all around, reduplicated and, besides a fringe of tactile filaments, bear numerous conspicuous eyes of a brilliant blue or silvery lustre. These eyes are the most complex known among the *Pelecypoda* and consist of a nervous layer, a choroid coat, lens and cornea and receive an optic nerve from the circumpallial trunk. The gills are delicate and of peculiar structure, the foot small and papilliform and in the young has a byssus gland, and the genital ducts open into the kidneys or near their apertures.

SCALP, n. *skălp* [O.It. *scalpo*, the skin of the head: Dut. *schelp*, a shell: L. *scalpĕrĕ*, to cut, to carve; *scalprum*, a surgeon's knife]: skin of the top of the head from which the hair grows (see SCALP, THE): in *N. Amer. Indian warfare*, the skin and hair of the top of the head torn or cut off: V. to cut or tear the skin and hair from the top of the head. SCALP'ING, imp. and a. depriving of the skin and hair of the top of the head. SCALPED, pp. *skălpt*. SCALPING-IRON, or SCALPER, in *surg.*, an instrument used in scraping foul and carious bones. SCALPING-KNIFE, a sharp knife used by the N. Amer. Indians in scalping their enemies.

SCALP, n. *skâlp*, or SCAUP, n. *skawp* [Dut. *schelp*, or *schulp*, a shell (see SCALLOP)]: in *Scot.*, a bed of oysters or mussels in an estuary or sea.

SCALP, THE: outer covering of the skull or brain-case. Except in the fact, that hair in both sexes grows more luxuriantly on the scalp than elsewhere, the skin of the scalp differs slightly from ordinary skin. But besides the skin, the scalp is composed of the expanded tendon of the occipito-frontal muscle, and of intermediate cellular tissue and blood-vessels. Injuries of the scalp, however slight, must be watched with caution, for they may be followed by erysipelas, or by inflammation and suppuration under the occipito-frontal muscle, or within the cranium, or by suppuration of the veins of

the cranial bones, and general pyæmia that may easily prove fatal. In the treatment of a wound of this region, no part of the scalp, however injured it may be, should be cut away; and, if possible, the use of stitches should be avoided, as plasters and bandages will generally suffice to keep the separated parts in apposition. Owing to the possible serious outcome of scalp wounds, their treatment should always be entrusted to the surgeon. The patient should be confined to the house (and in severe cases to bed), should be moderately purged, and fed on non-stimulating, but not too low diet.

Burns of the scalp are liable to be followed by erysipelas and diffuse inflammation.

Tumors of the scalp are not rare, the most frequent being the cutaneous cysts popularly known as *Wens* (q.v.), and vascular tumors.

SCALPEL, n. *skăl'pĕl* [F. *scalpel*—from L. *scalpel'lum*, a scalpel—from *scalpo*, I carve: It. *scalpello*]: a knife used in dissections and surgical operations. SCALPEL'LIFORM, a. *-lĭ-fawrm* [L. *forma*, shape]: shaped like the blade of a scalpel.

SCALPER: a common term in the United States applied to any person who buys railroad, theatre, or steamship tickets at a discount from people unable to use them, and sells them again at an advance on the price he paid for them. Theatres and transportation companies have devised various plans to break up this trade, and in some states laws have been passed forbidding the sale of railroad tickets at cut-rate prices.

SCALPING: the act of partly cutting and partly tearing off the skin of the head, with the hair attached, of a living or dead victim. Scalping was practiced not only by the American Indians, but also, in early times, by most of the savage and barbarous nations of the eastern hemisphere, as the Scythians, Gauls, and other wild peoples of Asia and Europe. Sometimes the entire head was taken in lieu of the scalp. After the scalp was taken, it was tanned and then stretched on a small hoop of wood, and the side opposite to that having the hair was painted in various colors, and even the hair was tinted likewise; sometimes the portrait or the hieroglyphic device of the person scalped was placed on it. Persons scalped did not always die from the effect. Scalps were regarded as trophies of victory and prowess. Joutel relates that in 1687 among the Cenis of Texas, a scalp was waved or offered in ceremony to the four quarters of the world, and that tobacco and hominy were offered to the scalps that were paraded. In 1703, Bienville offered 10 'escus' (*écus*, about 10 crowns) for every scalp of a man killed or prisoner taken of the Chetimachas and Alibamons (Alibamas). The American colonies offered bounties for scalps. In 1724 Massachusetts offered 100 pounds sterling (about $500) for Indian scalps; 30 years later, during the so-called French and

Indian war, the French offered a bounty for British scalps, and the colonists for Indian scalps. In 1755, 40 pounds sterling (about $200) was offered by Massachusetts for the scalps of male Indians over 12 years of age, and 20 pounds sterling (about $100) for the scalps of women and children.

SCALPRIFORM, a. *skăl'prĭ-fawrm* [L. *scalprum*, a chisel or knife—from *scalpo*, I carve; *forma*, shape]: knife-shaped; having a cutting edge on one side. SCALPRUM, n. *skăl-prŭm*, the cutting edge of the incisor teeth.

SCALY. See under SCALE 1.

SCAMANDER, *ska-măn'dėr:* ancient name of a river in the Troad, which, according to Homer, was called also Xanthus [Gr. yellow] by the gods, and as a divinity took an important part in the Trojan war, its destructive floods doing serious injury to one party, and thus materially assisting the other. The Scamander rose in Mount Ida and, flowing w. and n.w., discharged itself into the Hellespont, after being joined by the Simois, about 2 m. from its mouth; the two rivers, however, since the 1st c. after Christ, have had separate courses. There has been much controversy as to what modern river corresponds to the ancient Scamander; but recent investigators have settled in favor of the Mendereh. See TROY.

SCAMBLE, v. *skăm'bl* [Icel. *skammr*, scamped, scanty: a parallel form with *scramble:* comp. also *scamper*]: in *OE.*, to scramble; to make shift; to mangle. SCAM'BLING, imp. scrambling. SCAMBLED, pp. *skăm'bld.* SCAMBLER, n. *skăm'blėr*, a bold intruder upon one's generosity or table.

SCAMILLUS, *skâ-mĭl'lŭs:* small plinth below the bases of Ionic, Corinthian, and other columns.

SCAMMONY, n. *skăm'mŏ-nĭ* [F. *scammonée*—from L. *scammōnĕa;* Gr. *skammōnĭa*, scammony]: a plant from whose root is obtained a sort of gum-resin (also called Scammony) of ashy-gray color, rough externally, of acrid taste, and having a resinous splintering fracture. Few drugs are so uniformly adulterated as Scammony, which, when pure, contains 81 to 83 per cent of resin (the active purgative ingredient), 6 or 8 of gum, with a little starch, sand, fiber, and water. The ordinary adulterations are chalk, flour, guaiacum, resin, and gum tragacanth. SCAMMO'NIATE, a. made with or containing scammony.

Scammony, when pure, is an excellent and trustworthy cathartic of the drastic kind, well adapted for cases of habitual constipation, and as an active purgative for children. The resin of Scammony, extracted from the crude drug by rectified spirit, possesses the advantage of being always of nearly uniform strength, and of being almost tasteless. The *Scammony Mixture*, composed of four grains of resin of Scammony triturated with two ounces of milk, until a uniform emulsion is obtained, is an admirable purgative for young children to be taken in

doses of half an ounce or more. According to Christison, 'between 7 and 14 grains of resin, in the form of this emulsion, constitute a safe and effectual purgative' for adults. Another popular form for administration is the *Compound Powder of Scammony*, composed of S., jalap, and ginger, the dose for a child being 2 to 5 grains, and for an adult 6 to 12 grains. S. is frequently given surreptitiously in the form of biscuit to children troubled with thread-worms.

The plant which produces this valuable drug is *Convolvulus Scammonia* (see CONVOLVULUS), native of the Levant. It is a perennial; with a thick fleshy tapering root, 3–4 ft. long, 3–4 inches in diameter, which sends up several smooth, slender twining stems, with arrow-head-shaped leaves on long stalks. The root is full of an acrid milky juice, which indeed pervades the whole plant. The S. plant is not cultivated, but the drug is collected from it where it grows wild. The ordinary mode of collecting is by laying bare the upper part of the root, making incisions, and placing shells or small vessels to receive the juice as it flows, which soon dries and hardens in the air.

Scammony (*Convolvulus Scammonia*).

The name *French* or *Montpellier Scammony* is given to a substance prepared in s. France, chiefly from the juice of *Cynanchum Monspeliacum*, plant of nat. order *Asclepiaceæ*. It is a violent purgative.

SCAMP, n. *skămp* [Dut. *schampen*, to shave, to slip away; *schampig*, slippery]: a cheat; a rascal; a rake; a worthless fellow. SCAM'PISH, a. *-pĭsh*, of or like a scamp. *Note.*—'A workman is said to *scamp* his work when he does it in a superficial dishonest manner.'—Wedgwood. According to Skeat, *scamp* is the original form of *scamper*, the primary meaning of *scamp* being fugitive, hence vagabond.

SCAMPER, v. *skăm'pĕr* [It. *scampare*, to escape—from L. *ex*, out of; *campus*, a plain, a field of battle: comp. Bav. *gampern*, to sport, to spring about: Sw. *skumpa*, to jog]: to run with speed; to hasten in flight: N. a run; a hasty flight. SCAM'PERING, imp.: N. act of one who scampers. SCAM'PERED, pp. *-pĕrd*.

SCAN, v. *skăn* [L. *scandĕrĕ*, to climb, to scan: It. *scandere:* F. *scander*]: to examine with critical care; to examine poetry by counting the feet and telling of what kind they are. SCAN'NING, imp. SCANNED, pp. *skănd*. SCANSION, n. *skăn'shŭn*, or SCANNING, n. *skăn'ĭng*, the act of critically examining the rhythm of poetry, and ascertaining the number and kind of feet in each verse.

SCANDAL, n. *skăn'dăl* [F. *scandale*, scandal—from L. *scan'dălum*—from Gr. *skan'dalon*, a snare, a cause of offense—*lit.*, a pitfall or snare laid for an enemy: It. *scandalo*]: something uttered injurious to the reputation of others, which is either wholly or partially untrue; offense or injury occasioned by a wrong action; detraction; calumny; in *OE.*, a stumbling-block: V. in *OE.*, to charge falsely with faults. SCAN'DALIZE, v. *-īz*, to disgrace; to shock; to offend by some supposed improper action. SCAN'DALIZING, imp. SCAN'DALIZED, pp. *-īzd*. SCAN'DALOUS, a. *-ŭs*, shameful; giving public offense; disgraceful to reputation; openly vile or infamous; defamatory. SCAN'DALOUSLY, ad. *-li*. SCAN'DALOUSNESS, n. *-nĕs*, the quality of being scandalous or disgraceful.—SYN. of 'scandal, n.': detraction; slander; reproach; disgrace; offense; defamation; calumny; opprobrium; shame;—of 'scandalize': to shock; defame; traduce; displease; annoy; slander; calumniate; asperse; disgrace; vilify; libel.

SCANDALUM MAGNATUM, *skăn'dā-lŭm măg-nā'-tŭm*: offense of speaking words in derogation of a peer, judge, or great officer of the realm. Formerly in England, a special action was brought for such words, the punishment being damages and imprisonment. This proceeding, though not expressly abolished, is superseded by Criminal Information (q v.), indictment, or action.

SCANDENT, a. *skăn'dĕnt* [L. *scandens* or *scanden'tem*, climbing—from *scandĕrĕ*, to climb]: in *bot.*, climbing; climbing by means of supports, as on a wall or rock; performing the office of a tendril.

SCANDERBEG, *skăn'dĕr-bĕg* (properly, *Iskander-beg*, 'the Prince Alexander,' name given him by the Turks): famous patriot chief of Epirus; about 1404–1467, Jan. 17; b. in Epirus (real name George Castriota); son of John Castriota, one of the great lords of Epirus, his mother, Voisava, being a Servian princess. In 1423, he was given as one of the hostages for the obedience of the Albanian chiefs, and was sent to the Ottoman court, where his physical beauty and intelligence so pleased Amurath II. that he was lodged in the royal palace, and subsequently circumcised and brought up in Islamism, being also put under skilful masters in the Turkish, Arabic, Slav, and Italian languages. In 1433, he greatly distinguished himself in Asia as a Turkish pasha (of one tail); but being offended at the confiscation of his paternal domains, and being solicited by some Epirote friends to return to his native country to aid in the restoration of its independence, he sought to withdraw from the Turkish army. The unsuspicious sultan, who had caused him to be brought up as his son, gave him the command of a large division of the army which was to act against the Hungarian invaders. S., having concerted his plans with 300 of his countrymen in the Turkish army, deserted during the confusion of the first battle (1443), and having previously compelled Amurath's secretary (whom he afterward killed to avoid detection) to prepare an order investing him with

the govt. of Croia (now *Ak-hissar*), cap. of Epirus, he and his companions fled thither. The unsuspecting governor resigned the town into his hands, and was massacred with the garrison. At the news of S.'s success, the whole country rose in insurrection, and in 30 days he had driven every Turk, except the garrison of Sfetigrad, out of the country. To strenghten himself in his new position, he invited neighboring princes and Albanian chiefs to a conference, at which it was unanimously agreed to make no terms with the Turks, and to obey S. implicitly as their leader. S. then raised an army of 15,000 men, with which he completely scattered (1444) the 40,000 Turks, whom the indignant sultan had sent against him, killing an immense number of them, and taking a few prisoners. Three other Turkish armies met the same fate, and the 'animus' with which the contest was carried on may be imagined, when we consider that the number of prisoners taken in the last (1448) of these three battles was only 72. Amurath himself 1449 took the field, and stormed many of the principal fortresses, but being then ill of his fatal malady, he retired from before Croia, to die at Adrianople (1450). S.'s splendid successes brought congratulations from the pope and the sovereigns of Italy and Aragon; but many of the Epirote chiefs were becoming wearied of the continual strife, and fell off from him, some even joining the Turks. S.'s career thus became less continuously successful; but in spite of occasional defeats, he stoutly refused the liberal proposals of the sultan, Mohammed II., who had a profound admiration for him, and sheltered by the mountainous nature of his country, carried on unceasing warfare. At last an armed convention was agreed to 1461; and S. profited by this leisure to pay his debt to the pope and the king of Aragon (both of whom had supplied him with material assistance during his greatest need); and crossing to Italy he routed the partisans of Anjou, and restored the kingdom of Naples to the king of Aragon; returning home laden with honors and benedictions. At the instigation of the pope, who had tried in vain to raise the other Christian princes of Europe against the Turks, S. broke the armed truce 1464, and repeatedly defeated the Turks; but Mohammed, becoming furious at these unprovoked aggressions, equipped two mighty armies; the first of which invested Croia, and the second, under his own leadership, advanced more leisurely. The first army was, after a desperate contest, defeated by S. 1466; but the restless and indomitable chief, worn out with the incessant toil of 24 years, died at Alessio the following year. The war continued some time longer, but the great mainstay of the country was now gone; and before the end of 1478, the Turkish standard floated undisturbed over Epirus. Barlesio, a countryman of S., who wrote his biography (*De Vita et Moribus ac rebus gestis Geo. Castrioti*, Rome 1537), remarks his sobriety, the purity of his manners, and the strictness of his religious belief. He had vanquished the Turks in 22 pitched battles

SCANDEROON': see ISCANDERÛN.

SCANDINAVIA, *skăn-dĭ-nā'vĭ-a:* large peninsula in n. Europe, bounded n. by the Arctic Ocean; w. by the Atlantic North Sea, Skager Rack, Cattegat, and Sound, s. and e. by the Baltic Sea, Gulf of Bothnia, and by Finland, with which it is connected on the n. e. by an isthmus 325 m. wide. This peninsula comprises the two kingdoms, Norway (q.v.) and Sweden (q. v.); is 1,240 m. long, 230 to 460 m. broad; 300,000 sq. m. The ridge of mountains which traverses the peninsula in the direction of its length gives character to the whole conformation. The w. division of the Scandinavian peninsula is covered with mountains; the e. half, Sweden, consists principally of low-lying country. The mountains of S. extend from Waranger Fiord, in the extreme n. e. to the promontory of the Naze, in the extreme s. w., with average breadth 180 m. They consist principally of gneiss and micaceous schist, sometimes, but rarely, of porphyry, syenite, granite and chalk; salt is not found; silver, copper, and iron abound. The Scandinavian Mts., though in reality one great range, are considered as forming four sections—the Lapland Mts. in the n. 1,000 to 2,060 ft. high; the Kjolen Mts. 1,500 to 2,575 ft. high; the Dovre Fjelde, 2,500 to 3,600 ft. high; and the Southern Fjelde, 4,000 to 5,150 ft. high. Though of inconsiderable height, yet the numerous glaciers and snow-fields impart to this range almost an Alpine character. The climate of S. is much milder on the w. than on the e. side, probably from the influence of the Gulf Stream. For the character of the country, its physical features, industries, etc., see NORWAY: SWEDEN.

The ancient *Scandia,* or S., included n. Denmark, as well as the peninsula that still retains the name. It is mentioned first by Pliny, who, unaware that the peninsula was attached to Finland on the n., considered S. as an island.

SCANDINA'VIAN LANGUAGE AND LITERATURE: language and literature, during the heathen ages, of the Germanic population in all the northern European or the Scandinavian lands, and which, in traditionary belief, had been introduced by Odin and his companions, when the Gothic tribes supplanted the more ancient races of the Finns and Lapps. It is referred to by the oldest authorities always either as the *Dönsk túnga,* 'Danish tongue,' or as the *Norræna,* 'Norse.' We never hear of the 'Swedish' or 'Gothic tongue,' for though different dialects no doubt existed from a very early period among the Scandinavian people, it is certain that substantially the same language was spoken by the Northmen generally till the 11th c. According to recent inquirers, the race of the Northmen, before their settlement in Sweden and Norway, was divided into an e. and w. branch, the former of which is supposed to have used the old language of Norway and Iceland, and the latter the Swedish and Danish dialects. These two divisions of the race had entered Scandinavia by different routes, the eastern having passed along the Gulf of Bothnia through the country of

the Finns and Lapps, while the western branch had crossed from Russia to the Aland Islands, and spread thence southward and westward; and it seems natural to infer that in their respective lines of migration they may have incorporated into their own speech some of the special characteristics that belonged to the language of the peoples with whom they came in contact. But the differences thus introduced could not have been important, for we find the same language employed in the several most ancient laws of the different people of Scandinavia, while the two Eddas (q. v.)—oldest monuments of Scandinavian speech—which were compiled in Iceland, whither the Northmen had carried their language on their settlement in the island in the 9th c., give evidence of an almost complete identity of local and personal names. This unity of language is further proved by the agreement found to exist in all runic inscriptions, from Slesvig to the n. parts of Sweden, and from Zealand to the w. shores of Iceland. All monuments of this old Northern tongue would, however, have been lost to us, had not the Norrœna or Norwegian form of it been carefully preserved and cultivated in Iceland through the short songs (*hljod*, or *quida*) relating to the deeds of the gods and heroes of the north, which had existed as early probably as the 7th c., and had passed with the religion and usages of Norway to the new colony. After the introduction of Christianity into Iceland 1000, schools were founded there, classic literature was cultivated, and Roman characters were adopted for writing the national tongue; but this did not interfere with the zeal with which the national laws and poems were collected and studied by native scholars. This literary activity continued unabated till the 13th c., when the republic of Iceland, after having long been distracted by the dissensions of the rival aristocratic families of the island, was conquered by Hakon VI., King of Norway. Since 1397, Iceland has formed part of the Danish dominions, and though since that period the colonists have partly succumbed to the cramping influences of the subordinate and dependent conditions in which they have been placed; the distance from the mother-country, and the tenacity with which the people cling to all memorials of their former history, have enabled them to preserve their language so unchanged that the Icelander of the present day can read the sagas of a thousand years since, and still write in the same phraseology that his forefathers used ages ago. But while the old Scandinavian tongue was thus preserved in the distant colony, it had undergone great changes in Norway; and when, by the union of Calmar 1397, the latter country was united to Denmark, the Danish form of speech, that had in the meanwhile been changing under the modifying influences due to introduction of Latin and to contact with other nations, supplanted the Norwegian language, which thenceforth being banished from the pulpit, the law courts, and from literature, split into numerous dialects peculiar to special valleys and fjords, but unknown in the larger towns.

SCANDINAVIAN LANGUAGE AND LITERATURE.

When we come to examine the Icelandic or ancient Scandinavian, which is closely allied to its sister Teutonic languages, and like them betrays its eastern origin, we find that it differs from them in several important points. It has this striking peculiarity, that the definite article, instead of coming before the noun, is appended as a termination to the end of the word. The adjective, moreover, which in its indefinite form is subject to inflections, for all genders and cases, undergoes, when in its definite form, fewer and slighter changes. Again, while in the German tongues the verb in the infinitive ends in a consonant, in the old Scandinavian it invariably terminates in a vowel. The old Scandinavian language has a passive form of the verb unknown to its Gothic sister tongues; and while in German the third person of the present tense differs from the second person, it is not so in Old Northern. In the latter, the vowel sounds are greatly modified by a very perfect system of combinations, indicated by dots or accents; and in addition to the consonants of the Gothic languages, it has an aspirated *d* and *t*. It possesses, moreover, a flexibility and richness of construction which admit of favorable comparison with those of the ancient classical languages; while in number and comprehensiveness of words, and consequent independence of foreign derivates, it presents a regularity and unity lacking in the other Germanic languages. Its mode of construction is simple in prose, and in the earlier forms of poetry, though in the later periods of the Scalds (q. v.) it degenerated into an artificial complexity. The chief feature of the metrical system employed in Old Northern poetry was Alliteration (q. v.). The alliterative method was continued after the introduction of terminal rhyme; but the simplicity of the ancient lay gave way in the 10th c. to the most artificial complexity of versification in the meters invented by the skalds. Besides these scaldic measures, of which 106 are enumerated in the *Hattalykil*, or Key of Meters, drawn up in the 13th c. by the Icelander Snorre Sturlason (q. v.), the scalds were required to know the *Kenningar*, or poetic synonyms, of which there were an enormous number; some words, as Odin, island, etc., having more than 100. The main feature of the system was that nothing must be called by its right name: thus a ship was a beast of the sea, a serpent of the waters, a dragon of the ocean, etc.; a woman was a graceful tree, a fair pearl, etc.; a wife was her husband's *Rune* (q. v.), or his confidential and intimate friend, etc.

The fragments of Old Northern poetry that have come down to us in the *Eddas* belong for the most part to the 8th c., or even perhaps to the 7th c.; and consist of short songs (*hljod* or *quida*), either mystic, didactic, mythic, or mytho-historic: see EDDA. It is supposed that some of these compositions, and several of the poems which celebrate the adventures of the gods, giants, and elves, were composed prior to the immigration into Scandinavia of Odin and his followers; while, on the other hand, the local

coloring of others sufficiently prove their northern origin. In addition to the subjects belonging to the Odinic mythology, we have in the mytho-historic lays, known as the songs of the famous Smith Völundr, or the *Völundarquida*, a cyclus of heroic poems similar to the Old German epic the *Nibelungenlied* (q. v.); but much more ancient in form than that in which the latter has reached us. In the 9th and 10th c. the ancient epic and the simple songs of the older poets gave place to the artificial poetry of the scalds, which, from its earliest development, manifested a realistic tendency, and made the real adventures of living men the subject of their compositions. Many of these compositions—e. g., the *Eiriksmál*, or the Death and Apotheosis of King Erik Bloodaxe (died 950); the *Hakonar-mal*, or Fall of Hakon the Good; and several poems by the famous Icelandic scald Egil Skalagrimson, while they afford valuable materials for the early history of the North, are among the latest of the skaldic productions that preceded the more degenerate periods of the art. To the 11th and 12th c. belong the poems *Groagaldr* and *Solarljod*, composed in imitation of the ancient compositions, and consisting of moral and didactic maxims, the former conceived from an assumed heathen, and the latter from a Christian point of view. In the 13th c. the skaldic art thoroughly declined, and gave place, in Iceland, to a puerile literature, based on biblical stories and saints' legends. In Scandinavia proper, a more modern form of national literature was meanwhile being gradually developed by oral transmission, whence arose the folk-lore and popular songs of Norway and Sweden, and the noble Danish ballads known as the *Kæmpeviser*, whose composition in the Old Northern or Icelandic tongue may probably be referred to the 14th c. The earliest Icelandic prose belongs to the beginning of the 12th c., when Ari 'hinn Frode,' or the Wise, composed a history of his native island and its population in the *Islendinga-bok* and *Landnâma-bok*, the latter continued by others. He was the first northern writer who attempted to assign fixed dates to events by reference to a definite chronology, and his work is remarkable as the earliest historical composition in the old Danish or Norse as it still remains in the living language of Iceland. These works, which have perished, entered largely into the composition of the annals of the early kings of Norway, compiled a century later by Snorre Sturlason under the title *Heimskringla*. Throughout the middle ages the literature of Iceland was enriched with numerous national and other sagas, whose materials were drawn from scaldic songs, folk-lore, local traditions, and family histories; and in its later stages of development included among its subjects the mythic cycle of Arthur and his knights, Merlin, Alexander, Charlemagne, etc. The compilation of the laws of the island attracted the attention of the Icelanders at an early period; and 1118 a complete code, the Gragas, derived from the ancient Norse law, was submitted to the Althing or popular assembly,

and a few years later the canons of the church, or the *Kristinrettr*, were settled and reduced to writing. A collection of those enactments, in the ancient and subsequent codes still in force in Iceland, has been made by Stephensen and Sigurdsson (Copen. 1853), under the title *Lovsamling for Island* (17 vols. 1853-1877); while the ancient Norse laws, beginning with the *Gulathings-lôg* and the *Hirdskra* of Hakon the Good, which date from the 10th c., have been ably and critically edited in Norway under the title *Norges gamle Love* (Christ. 1846-49). The study of the Old Northern language and literature, successfully begun by the native scholars of Iceland in the 17th c., was soon prosecuted with equally happy results in Denmark and Sweden, and within the last twenty years in Norway, where the subject forms a necessary introduction to the investigation of the language and history of the country. Copenhagen has in recent times been the principal seat of these inquiries. Among the Icelandic and Danish scholars who have gained pre-eminent distinction in these researches, are Arne-Magnussen, Torfæus, Olavsen, Finn Magnussen, Worm, Resenius, Bartholin, Thorlacius Müller, Rask, Rafn, Keyser, Munch, Unger, Lange, etc. Rask (q. v.) did noble service. Jakob Grimm, Munch, and others, threw much light on the affinities of the Old Northern tongues.—See *History of the Literature of the Scandinavian North*, by F. W. Horn (transl. by Anderson; Chicago 1883). An invaluable work is the *Corpus Poeticum Boreale: the Poetry of the Old Northern Tongue to the Thirteenth Century* (1883), edited, translated, and illustrated with notes and excursuses by Vigfusson and Powell, whose great Icelandic Dictionary is the standard.

SCANDINA'VIAN MYTHOL'OGY: system of legends and beliefs, setting forth the religious ideas of the Germanic peoples of n. Europe or Scandinavia before the introduction of Christianity. According to Vigfusson, the most ancient cult was the homely household worship of the spirits of the dead at the family grave, though the nation may collectively have worshipped the air or sky or thunder. The mythology described below—usually regarded as *the* S. M.—is, according to this scholar, much later in origin, and, like the northern literature, may have borrowed much from Irish and other Celtic sources, as also from pre-Aryan peoples. Our knowledge of S. M. is derived mainly from the collections of ancient northern sagas known as the Eddas (q. v.), which constitute the Odinic Bible, as it were, of heathen Scandinavia. The value and interest attaching to these records of the ancient faith of the Northmen are enhanced by the fact that there are strong grounds for assuming that the closest affinity, if not identity, of character existed between their religious doctrines and practices and those of the Germanic nations generally. Hence, in the absence of anything beyond the incidental notices of the pagan religion of Germany in the classic writers, the Eddaic

exposition of northern mythology is of high importance to the student of the history of every nation of Teutonic origin. The remote situation of the Scandinavian lands, and the hold which the Odinic religion had taken of the minds of the Northmen—whose natural tendencies inclined more to the pagan merits of valor, courageous endurance of hardships, indomitable resolution, and unflinching fidelity in hate and love, than to the Christian virtues of submission, meekness, and forgiveness of injuries—caused Christianity to take root only slowly and insecurely in those lands, long after a national literature, based on the superstitions and memorials of the ancient faith, had been firmly established among the people. But though there is every reason to believe that all branches of the great Indo-Germanic family of nations had essentially the same system of belief and worship, and venerated the same deities, minor differences were numerous. Thus, e. g., while Danes, Saxons, and Gothlanders worshipped Odin as their chief god, the Swedes generally paid supreme honors to Frey, the god of the year; some tribes of n. Germany regarded Hlodyn, or the Earth, as their principal deity; and the Norwegians directed their worship to Odin's son, Thor; while in parts of Norway even, e. g., in Helgeland, the people worshipped deities not honored elsewhere in Scandinavia. Thus the chief objects of worship in the latter district were Thorgerd, Horgabrud, and Irpa, daughters of Halogi, or High Flame, from whom the name of the country was derived, and who was probably identical with Loke (Fire), who, after having, according to the myth, been beneficent in the beginning of time and united with the All-father, fell from his high estate, and, like some fallen angel, became crafty, evil, and destructive as a desolating flame. Helgeland appears from remains discovered there to have been a special seat of fire or sun worship, which seems to have been nearly universal at one period of the world's history.

Leaving for the present the discussion of the sources whence the northern mythology derived some of the numerous complex elements which entered into its composition, we proceed to give a short summary of its cosmogony.—In the beginning of time, a world existed in the north called Niflheim, in the middle of which was a well, Hvergelmer, from which sprang 12 rivers. In the south was another world, Muspelheim, a light, warm, radiant world, whose boundary was guarded by Surt with a flaming sword. Cold and heat contended together. From Niflheim flowed venomous, cold streams called Elivagar, which, hardening into ice, formed one icy layer upon the other within the abyss of abysses that faced the north and was known as the Ginnunga-gap. From the south streamed forth the sparkling heat of Muspelheim; and as heat met cold, the melting ice-drops became instinct with life, and produced, through the power of him who had sent forth heat, a human being, Ymer, progenitor of the

frost-giants, by whom he was called Ergelmer, or Chaos. He was not a god, but evil, both he and all his race. As yet there was neither heaven nor earth, neither land nor sea, but only the abyss Ginnunga-gap. Ymer drew his nourishment from the four milky streams which flowed from the udders of the cow Audhumla, a creature formed from the melting frost. From Ymer there came forth offspring while he slept—a man and woman growing from under his left arm, and sons from his feet; and thus was generated the race of the frost-giants, or Hrimthursar, among whom the All-father dwelt in the beginning of time, before the heavens and the earth were created.

In the meanwhile, as the cow Audhumla licked the frost-covered stones, there came forth the first day a man's hair, the second day a head, and the third day an entire man. This man, *Buri*, or the Producing, had a son *Bör* (the Produced), who married Bestla, one of the giant race, by whom he had three sons, Odin, Vile, and Ve. See GIANTS AND DWARFS (Mythological).

These three brothers, who were gods, slew Ymer, and carrying his body into the middle of Ginnunga-gap, formed from it the earth and the heavens. Of his blood they made all seas and waters, taking the gore that flowed from his body to form the impassable ocean which encircles the earth; of his bones they made the mountains, using the broken splinters and his teeth for the stones and pebbles; of his skull they formed the heavens, at each of the four corners of which stood a dwarf—viz., Austre at the e., Vestre at the w., Northre at the n., and Suthre at the s. Of his brains they formed the heavy clouds, of his hair plants and herbs of every kind, and of his eyebrows a wall of defense against the giants round Midgard, the central garden or dwelling-place for the sons of men. Then the three brothers took the glowing sparks that were thrown out of the world Muspelheim, and, casting them over the face of heaven, raised up the sun, moon, stars, and fiery meteors, and appointed to each its place and allotted course; and thus arose days, months, and years.

Night was of the race of the giants, and in turn married three husbands, by one of whom she had a daughter, Earth, and by another a son, Day, who was bright and beautiful like the gods, or Œsir, to whose race his father Delling belonged. To this mother and son, who were akin to the opposite races of the frost-giants and the gods, All-father committed chariots and horses, and placed them in heaven, where Night rides first through her 24 hours' course round the earth with her horse Hrimfaxe, from whose bit fall the rime-drops that each morning bedew the face of the earth. Close after her comes her fair son Day, with his horse Skinfaxe, from whose shining mane light beams over heaven and earth. All the maidens of giant race were not dark like Night, for to Mundilfare were born a son and daughter of such beauty that their father gave them the names Mane, or Moon, and Sol, or Sun. The gods, incensed at this presumption, took them up to

heaven, and ordained that they should direct the course of the sun and moon, which had been made to give light to the world; and thenceforth Sol drove the chariot of the Sun, which was drawn by two horses, Arvak (the Watchful) and Alsvid (the Rapid), under whose shoulders the gods in pity placed an ice-cool breeze. A shield named Svalin (the Cooling) was also by their care attached to the front of the car, to save sea and land from being set on fire. Mane directs the course of the moon, and he, like his sister, is followed by a wolf that seems about to devour him; and in the end of time this animal, which is of giant race, will with his kindred swallow up the moon, darken the brightness of the sun, let loose the howling winds, and sate himself with the blood of all dying men.

When heaven and earth were thus formed, and all things arranged in their due order, the chief gods or Œsir, of whom there were 12, met in the middle of their city Asgard, which lay on the plain of Ida. These gods were Odin, or All-father, who has 12 names in Asgard, besides many others on earth, Thor, Balder, Tyr, Brage, Heimdal, Hod, Vidar and Vale his sons, and Niord, Frey, Ull, and Forsete. Here they raised for themselves a court with a high seat for All-father, a lofty hall for the goddesses; and a smithy, in which they worked in metal, stone, and wood, but chiefly in gold, of which precious substance all the implements which they used were made; hence this period of their existence was known as the Golden Age.

This age of peaceful labor lasted till three beautiful but evil maidens made their way from the giants' world, Jotunheim, to Asgard, when confusion and ill-will arose in the world. Then the gods, taking counsel, determined to create new beings to people the universe, and first they gave human bodies and understanding to the dwarfs, who had been generated like maggots within the dead body of Ymer, but who now took up their abodes in the bowels of the earth, in rocks and stones, and in trees and flowers. Then Odin, with two companions, Hænir and Loder, went forth on an excursion to the earth, where finding two trees, Ask and Embla, they created a man and a woman of them, Odin giving them spirit or the breath of life, Hænir sense and motion, and Lodur blood and the image of the gods, with sight, speech, and hearing; and from this pair, whose dwelling was in Midgard, the human race has sprung. A bridge of three colors, Bifrost, known to men as the rainbow, connects Midgard with Asgard, and over this the gods ride daily on their horses to the sacred fountain of Urd, where they sit in judgment. This fountain lies at one of the three roots of the ash, Yggdrasil, whose branches spread over the whole world and tower above the heavens. Under one of these roots is the abode of Hel (q. v.), goddess of the dead, under another, that of the frost-giants, while under the third is the dwelling of human beings. Below the tree lies the serpent Nidhogg, who is constantly gnawing the roots, and striving with his numerous brood of lesser serpents to undermine Yggdrasil, whose branches

are as constantly refreshed by water from the well of Urd, which is poured over them by the Norns. These are three maidens known as Urd, Verdande, and Skuld (or Past, Present, and Future), who dwell in a fair hall below the ash-tree where they grave on a shield the destiny which they determine for the children of men.

Besides gods, frost-giants, dwarfs, and men, there were other beings, as the Vanir, who dwelt in the world Vanaheim, between the abodes of the gods and of men; and the Light Elves and Dark Elves, the former friendly to mankind, and of great beauty, while the latter were of evil, demoniacal natures, and blacker than pitch.

Now, after the three giant maidens came to Asaborg, dissensions soon broke out among these different races, and Odin, by casting a spear among mankind, created war and discord in the world. Then his maidens, the Valkyries (or choosers of the slain), surrounded by lightnings, rode forth with bloody corselets and radiant spears, to choose on every battle-field those who should fall, and to lead them into Valhal, where the chosen heroes, known as Einheries, daily go forth to fight and slay one another, but returning at early morn sound and fresh, recruit themselves for the next night's combats by drinking beer with the gods and eating the flesh of the sacred hog. It is, however, only men of rank, as jarls (or earls), who enter Odin's hall after death, for the base-born,or thralls, belong to Odin's powerful son, Thor (q. v), who rules over Thrudheim, and drives through the world in a chariot drawn by he goats, bearing with him his magic hammer Miolner, the iron gloves which he requires to grasp the haft, and his belt of power.

Among the gods there reigned good-will and happiness even after the rest of the world had been disturbed by war, until Loke, or the impersonation of evil, who in infancy had been Odin's foster-brother, was admitted into Asaborg as their equal. By his treachery, Balder (q. v.), the purest, most beautiful, and best loved of Odin's sons, was slain. The gods, indeed, had power to inflict temporary punishment on Loke, and to chain him under a hot sulphur spring, where he lay for ages; but at length a time will come when Loke's evil progeny will prevail over the gods and the world. This terrible age of destruction, the Ragnarok, or twilight of the gods, will be marked by a three years' winter of hard frost, cutting winds, and sunless air uncheered by summer or spring-tide, when there will be bloodshed throughout the world, brothers will slay one another, parents and children will be at war. The wolf Fenrer will break loose; the sea will burst its bounds as the serpent Jormundgand, encircling Midgard, writhes in fierce rage, and struggles to reach the land. The wolf Skoll will swallow up the sun, and when the world is plunged in almost total darkness, his brother Hate will devour the moon, while the stars will vanish from Heaven. As Midgard's serpent and the wolf Fenrer go forth, scattering venom through air and water, the heavens will be

rent asunder; the ship Naglfar, which is made of dead men's nails, will be floated on the waters; the asas will ride forth across the bridge Bifrost, which will break away behind them; and all the friends of Hel, led on by Loke, will offer battle to the gods on Vigrid's plain. Then Odin, having taken counsel at Mimer's well, will advance armed with his spear Gungner against the wolf Fenrer, while Thor encounters Midgard's serpent, and is killed by the venom which it exhales from its mouth. Although Fenrer, the wolf, will swallow Odin, and thus cause his death, he will himself be slain by the god Vidar, while Loke will fall beneath the hand of Heimdal, the watchman of the gods, and Surt, hurling fire from his hand, will burn up the whole world. After the conflagration of heaven and earth and the whole universe, there will still be dwellings for the evil and the good, the worst of which is Nastrand, a horrible habitation for perjurers and murderers, where serpent-heads pouring forth venom line the walls, while in Gimle, Odin's best heaven, the good and virtuous will find a happy resting-place.

But from the great destruction of the universe another earth, verdant and fresh, will arise, from the deep waters of the ocean; the unsown fields will bear fruits, and all evil will cease; Balder and other gods will then return to Ida's plain, where Asgard once stood, and taking counsel together, will find the golden tablets which their race had possessed at the beginning of time, and remembering their deeds of old, will await the coming of the mighty All-father, the ruler of all things, who will pronounce judgments, and establish peace that shall endure to the end of time.

The above brief epitome of the Odinic cosmogony serves as a framework for the numerous prose and poetic myths which make up the substance of northern mythology; and are contained in a rich mass of sagas, not all complete in themselves, but each throwing some light on the others.

Many theories have been advanced to explain the origin and the fundamental ideas on which the northern myths were based. Some expositors have seen in them a mere re-clothing of Bible narratives, and a perversion of Christian truths, by monks in the earlier middle ages; but all that can be safely accepted is, that they are partly historical and partly an impersonation of the active forces of nature. Like the northern languages, their original seat was in the south and east, where kindred mythologies existed among the ancient tribes of India and Persia; and it is probable that the more practical and energetic spirit of the northern myths, and the more warlike character of the gods of the north, compared with the reflective and contemplative nature of their oriental prototypes, may be due to the gradual effect on the minds of a people who had passed from the soft enervating influences of a southern clime to the stern rigors of the north, where man lived in constant warfare with the elements and with his fellow-men. According to Snorre Sturlason (q.v.), whose opinion seems to a

certain extent an echo of the traditional belief of his forefathers, Odin and his sons and companions were earthly kings of a sacerdotal caste, who had migrated from Asia —perhaps from Troy—and who conquered and ruled various parts of Scandinavia and n. Germany, where after their death they were regarded by the people as deities. In conjunction with this mode of representation, the mythic tales of the warfare of the gods with giants, their intercourse with dwarfs, and spirits of the air and water, and their wanderings on earth, are interpreted as memorials of real war with pre-existing races, and of the spread of Odin's religion from its chief seat in Sweden over the neighboring countries. This theory explains only a few of the myths; while some, as above observed, may be referred to traces of an older faith, which lingered among the Finns and Lapps after the advance of the more civilized conquering races had driven those tribes from the southern districts of Scandinavia, which they originally occupied, to the barren recesses of the north.

The worship of the gods was celebrated either in spacious temples, of which there were many in different parts of Scandinavia, or on stone heaps or altars, known as *horg*. These altars were always near some well, and close to a sacred grove, or a solitary tree, on which the votive offerings were suspended, after they had been washed at the neighboring spring by the attendant priestesses, known as *horgabrudar*. Human sacrifices, though never resorted to on ordinary occasions, were not rare in times of public calamity, e. g., war, failure of crops, disease, etc., and the horse, whose flesh was highly esteemed, was a frequent victim; but the fruits of the earth and spoils of war were the usual offerings. Three great festivals were held every year, the first at the new year in the Yule month, when Thorablot, or the sacrifice of Thorri, an ancient god of the Finns and Lapps, was offered. On these occasions, offerings were made to Odin for success in war, and to Frey for a fruitful year—the chief victim being a hog, which was sacred to Frey, on the assumption that swine first taught mankind to plow the earth. Feastings and Yule games occupied the whole month, whence it was called the Merry Month. The second festival was in mid-winter, and the third in spring, when Odin was chiefly invoked for prosperity and victory on the Viking, or sea-roving expeditions then entered upon. On the introduction of Christianity, the people were the more ready to conform to the great church festivals of Christmas and Easter, from the fact of their corresponding with the ancient national sacrificial feasts; and so deep-rooted was the adhesion to the faith of Odin in the north, that the early Christian teachers, unable to eradicate the old ideas, were driven to the expedient of trying to give them a coloring of Christianity. Thus the black elves, giants, evil subterranean sprites, and dwarfs, with which the Northmen peopled earth, air, and water, were declared by them to be fallen angels or devils, and under the latter character

suffered to retain their old denominations. Belief in these imaginary beings survived the spread of the Reformation, and can scarcely be said even yet to have died out in Scandinavian lands among the superstitious and ignorant; while among the more enlightened the myths connected with them are still related, and serve to give a poetic interest to special localities.—Our own association with the Scandinavian mythology is perpetuated in the names of the days of the week: see WEEK.

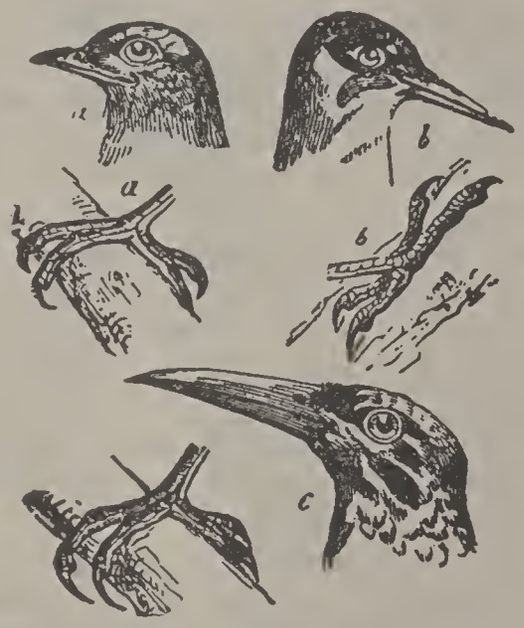
The best northern authorities on Scandinavian mythology are N. M. Petersen, *Nordisk Mythologi* (2d ed. 1865); the Norwegian works of Munch and Keyser; Jakob Grimm, *Deutsche Mythologie;* Simrock's *Handbuch* (4th ed., 1874); Mannhardt, *Die Götterwelt;* Thorpe, *Northern Mythology;* Victor Rydberg, *Teutonic Mythology,* tr. by R. B. Anderson (London 1889); R. B. Anderson, *Norse Mythology* (7th ed., 1901).

SCAN'DIUM, *skăn'dĭ-ŭm,* in chemistry: a rare metallic element discovered by Nilson (1879) in the mineral euxenite; symbol Sc; atomic weight 44.1. It is of special interest because its existence and properties were deduced theoretically by Mendeleef from his periodic system of the elements. He called the to-be discovered element ekaboron. As Nilson's Scandium showed exactly the same atomic weight and chemical properties foretold by Mendeleef it is a further proof of the value of the Mendeleef hypothesis. Scandium occurs in very small amounts in the minerals euxenite, gadolinite and yttrotitanite. It forms a white oxide Sc_2O_3 and a number of salts related to the same. The salts are colorless and have a rather acid astringent taste.

SCAN'LAN, *skăn'lăn,* LAWRENCE, American Roman Catholic bishop: b. Tipperary, Ireland, 1843, Sept. 28. He is the son of Patrick and Catherine Scanlan and was educated at All Hallows College, Dublin, where he was ordained priest in 1868. Coming to America, he was assistant at Saint Patrick's, San Francisco, Cal., 1868 to 1870, and at Saint Mary's Cathedral in that city for the two years following. In the end of 1871 he was sent to Pioche, Nev., where he built the first church in the section; in 1872 to Petaluma, Cal., in 1873 to Salt Lake City, Utah, where he was first pastor for Utah Territory and then vicar forane. He was so successful in his management of church finances in Salt Lake that he cleared the church of debt and raised a sum sufficient to purchase a large tract of land, on which he built an academy. This kind of work he followed until 1887, building churches and schools and in 1886 founding the College of All Hallows, in Utah. On 1887, Jan. 25, he was appointed bishop of Lavenden, *in partibus* and apostolic vicar of Utah. On 1887, June 29, he was consecrated at St. Mary's Cathedral, San Francisco, by Archbishop Riordan, assisted by Bishops O'Connell and Manogue. He became the first bishop of the diocese of Salt Lake, Utah, 1891, Jan. 30.

SCANNELL, *skăn'ĕl,* RICHARD, American Roman Catholic bishop: b. Cloyne, County Cork, Ireland, 1845, May 12. He was educated at the College of Middleton, Cork, and at All Hallows College, Dublin, at which latter place he was ordained priest, 1871, Feb. 26. He came to the United States the same year and was appointed assistant in Saint Mary's Cathedral, Nashville, Tenn. He served successively at Saint Columba's church, and as pastor of St. Mary's Cathedral, 1871-85, being administrator of the diocese of Nashville, 1880-3; and as pastor of Saint Joseph's church, West Nashville, which he organized, 1885–7. On 1887, June 9, he was appointed bishop of the diocese of Concordia, Kan., and was consecrated in Saint Mary's, Nashville, 1887, Nov. 30, by Archbishop Feehan, assisted by Bishops McCloskey and Rademacher. Upon the death of the Rt. Rev. Jas. O'Connor he was transferred 1891, Jan. 30, to the diocese of Omaha.

SCANSORIAL, a. *skăn-sō'rĭ-ăl* [L. *scansōrĭus,* belonging to climbing—from *scandĕrĕ,* to climb]: climbing, or formed for climbing; an epithet applied to the order of climbing birds, including the parrots and woodpeckers, called the SCANSO'RES, n. pl. *-rēz.* See CLIMBERS (under CLIMB).



Scansores:
a, Head and foot of Cuckoo; *b,* of Green Woodpecker; *c,* of Great Jacamar.

SCANT, a. *skănt* [Icel. *skammr,* short; *skamtr,* a measured portion: Norw. *skant,* a measured portion; *skanta,* to measure off]: scarcely sufficient; neither large nor plentiful; not liberal; parsimonious; barely fair; light as the wind: V. to limit; to straiten; to become less. SCANT'ING, imp. SCANT'ED, pp. SCANT'Y, a. *-ĭ,* not copious or full; hardly sufficient; sparing. SCANT'ILY, ad. *-ĭ-lĭ,* not fully; not plentifully; niggardly. SCANT'NESS, n. *-nĕs,* or SCANT'INESS, n. *ĭ-nĕs,* the condition or quality of being scant or scanty; narrowness.—SYN. of 'scanty': meagre; scarce; poor; deficient; narrow; small; short; sparing; parsimonious; niggardly; penurious; scant.

SCANTLE, v. *skănt'l* [OF. *eschanteler,* to cut off the corners or edges of—from *chantel,* a corner-piece—from mid. L. *cantellus,* a little corner: Ger. *kante;* It. *canto,* corner]: to divide into little pieces. SCANTLING, imp. *skănt'lĭng:* N. a small quantity; certain proportion; a sample; the size to which a piece of timber is to be cut; the sectional breadth and thickness of timbers for roofs, floors, etc.; also general name for quarterings or pieces of timber about 5 inches or less in thickness; in *masonry,* the size of the stones in length, breadth, and thickness; a rough sketch. SCANTLED, pp. *skănt'ld.* SCANT'LET, n. in *OE.,* a small quantity; a small pattern; a little piece.

SCAPE, n. *skāp* [L. *scāpus;* Gr. *skapos, skēptron,* a stem, a staff—from *skēptō,* I support: It. *scapo*]: in *bot.,* a naked flower stalk bearing one or more flowers arising from a short axis, and usually with radical leaves at the base, as in the cowslip or hyacinth; in an insect, the shorter part of each of the antennæ which is undivided; in *arch.,* part of the shaft of a column, where it leaves the base. SCAPE'LESS, a. *-lĕs,* destitute of a scape. SCAPIFORM, a. *skāp'ĭ-fawrm* [L. *forma,* shape]: resembling a scape.

SCAPE-GOAT, n. *skāp'gōt* [from *escape,* and *goat*]: among the *anc. Jews,* a goat on which the high priest, on the day of Atonement, solemnly laid the sins of the people, and which was afterward driven into the wilderness; any person on whom the faults of another may be fixed.

SCAPE-GRACE, n. *skāp'grās* [*escape,* and *grace*]: a graceless, worthless, hare-brained creature.

SCAPE, and SCAPEMENT [for *escape* and *escapement*]: see ESCAPE. SCAPE, n. *skāp,* flight from hurt or danger; means of escape; in *OE.,* deviation from regularity; negligent freak; loose act of vice or lewdness.

SCAPHA, n. *skăf'a* [L.—from Gr. *skaphē,* anything hollow]: in *anat.,* the cavity of the external ear, between the helix and the antihelix.

SCAPHITE, n. *skăf'īt* [L. *scapha;* Gr. *skaphē,* a light boat, a skiff]: in *geol.,* a genus of the ammonite family, peculiar to the Chalk formation, and so named from the boat-like contour of its shell.

SCAPHOGNATHITE, n. *skăf-ŏg'nă-thīt* [Gr. *skaphē,* a boat; *gnathos,* a jaw]: the boat-shaped appendage of the second maxilla in the lobster, the function of which is to spoon out the water from the branchial chamber.

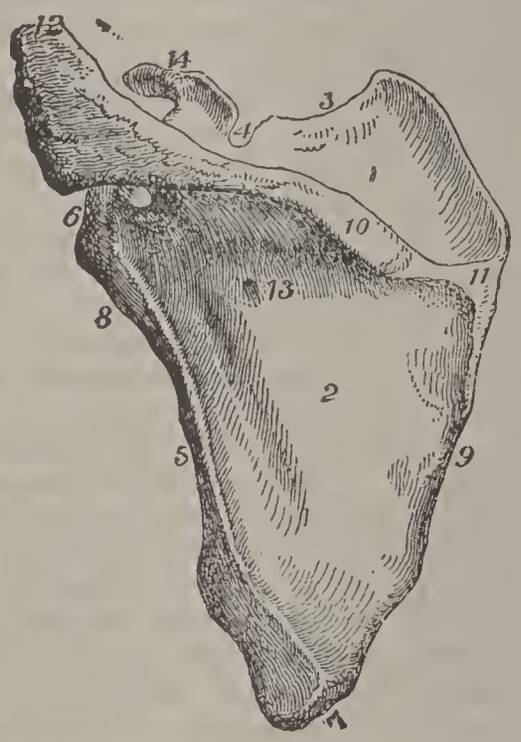
SCAPHOID, a. *skăf'oyd* [Gr. *skaphē,* a skiff; *eidos,* resemblance]: resembling a boat; applied to two somewhat boat-like bones—one in the carpus or wrist (see HAND), the other in the tarsus of the foot (q.v.).

SCAPOLITE, n. *skăp'ō-līt* [L. *scāpus;* Gr. *skapos,* a rod, a stem; *lithos,* a stone (see SCAPE 1)]: a mineral consisting of alumina and lime, occurring in long prismatic or rod-like crystals of various colors.

SCAPULA, n. *skăp'ū-lă* [L. *scap'ŭlæ*, the shoulder-blades] the blade-bone of the shoulder; plu. SCAP'ULÆ, *-lē* (see below). SCAP'ULAR, a. *-lĕr*, or SCAP'ULARY, a. *-lĕr-ĭ* [mid. L. *scapulāris*]: of or pertaining to the shoulder, or to the scapula: N. [F. *scapulaire*, a scapulary—from mid. L. *scapulārĭum*]: in *Rom. Cath. Chh.*, a portion of the monastic habit, worn on the shoulders (see below). SCAP'ULARS, n. pl. *-lĕrz*, the arteries near the shoulder-blade: the feathers which spring from the shoulders of wings.

SCAP'ULA, THE, or SHOUL'DER BLADE: flat triangular bone, which, when the arm hangs loosely down, extends posteriorly and laterally from the first to about the seventh rib. It presents for examination an outer convex and an inner, smooth, and concave surface, three borders (a superior, an inferior or axillary, and a posterior), three angles, and certain outstanding processes.

The figure represents an outer or posterior view of the S. It is divided into two unequal parts, the supra-spinous



A Posterior View of the Left Scapula:

The parts designated by the figures 1, 2, 4, 6, 8, 10, 11, 12, are sufficiently described in the text; 3 is the superior border; 5, the anterior or axillary border; 7, the inferior angle; 9, the posterior border or base; 13, one of the nutritious foramina; 14, the coracoid process. (From Wilson's *Anatomist's Vade Mecum.*)

fossa (1), and the infra-spinous fossa (2), by the spine (10), a crest of bone beginning at a smooth triangular surface (11) on the posterior border, and running across toward the upper part of the neck of the S. (8), after which it alters its direction and projects forward, forming a lofty arch, known as the acromion process (12), which overhangs the glenoid cavity (6), or receptacle for the head of the humerus or main bone of the arm. This acromion [from Gr. *acros ōmos*, summit of the shoulder] obviously serves to protect the shoulder joint, as well as to give great leverage to the del-

toid muscle which raises the arm. It is this process which gives to the shoulder its natural roundness From the upper part of the neck (8) proceeds a remarkable curved projection termed the coracoid process, from its supposed resemblance to the beak of a raven [Gr. *kŏrax*]. It is about two inches long, and gives attachments to several muscles. The upper border of the S. presents a very remarkable notch (4), which in the recent state is bridged over with a ligament, and gives passage to the supra-scapular nerve. This bone articulates with the clavicle and humerus, and gives attachment to no less than 16 muscles, many of which, e.g., the biceps, triceps, deltoid, serratus magnus, are very powerful and important.—The uses of this bone are as follows: 1. It connects the upper extremity to the trunk, and participates in and is subservient to many of the movements of the arm; 2. By its extended flat surface it furnishes a lateral protection to the chest; 3. It affords attachments to various muscles which modify the size of the thoracic cavity, and is thus concerned in respiration.

SCAP'ULAR, or SCAP'ULARY: portion of the monastic habit, so called from its being worn upon the shoulders It consists of a long strip of serge or stuff, the centre of which passes over the head, one flap hanging down in front, the other on the back. The S. of the professed monks in most orders reaches to the feet, that of the lay brothers only to the knees. The color differs for different religious orders or congregations. Besides the S. worn by the members of religious orders strictly so-called, there is also in the Rom. Cath. Church a religious assoc. or confraternity, whose members while living in the world and mixing in ordinary life, wear, though not conspicuously, a small religious emblem called a S. The chief duties of this confraternity consists in recitation of certain prayers, or observance of certain religious or ascetical exercises through devotion to the Blessed Virgin. The members may or may not bind themselves by a vow of chastity. This assoc. was founded in the middle of the 13th c. by an English Carmelite friar, Simon Stock, and is said to have originated in a vision, which has been the subject of much controversy, as well with Protestants as among Rom. Catholics themselves.

SCAPUS, n. *skā'pŭs* [L. *scāpus*, a stalk (see also SCAPE 1)]: the stem or trunk of a feather; the shaft of a column; a scape.

SCAR, n. *skâr* [Bret. *skarr*, a crack, a chap; *skarra*, to crack: Dan. *skaar*, a notch: OF. *escare;* Sp. *escara*, a scar —from L. *eschara*, a scar caused by burning: Gr *escara*, a fireplace, a scab made by cauterizing]: a mark left by a wound which has healed; any mark or blemish; in *bot.*, a mark upon a stem or branch seen after the fall of a leaf, or upon a seed after the separation of its stem. V. to mark as with a scar; to form a scar. SCAR'RING, imp. SCARRED, pp. *skârd.*

SCAR, n. *skâr* [L. *scarus;* Gr. *skaros*, the scarus]: a fish of the genus *Scarus*—usually called parrot-fish.

SCAR, n. *skâr*, or SCAUR, n. *skawr* [Icel. *sker*, a rock in the sea: Sw. *skär*]: in *Scot.*, a bare and broken place on the side of a hill or mountain; a naked detached rock. SCAR LIMESTONE, in *geol.*, a name applied to the lower group of the carboniferous limestone, as developed in bluff precipices or lofty scars.

SCARAB, n. *skăr'ăb*, or SCARABEE, n. *skăr'ă-bē*, or SCARABÆUS, n. *skăr'ŭ-bē'ŭs* [L. *scarăbēŭs;* Gr. *skarabos*, a beetle: F. *scarabée*]: a beetle; applied to such insects as the elephant and the Hercules beetles (see SCARABÆIDÆ). The figure of a beetle, plain or inscribed with characters, habitually worn by the anc. Egyptians and Etrurians as an amulet (see below).

SCARABÆIDÆ, *skăr-a-bē'ĭ-dē:* very numerous tribe of lamellicorn coleopterous insects (see LAMELLICORNES), of which more than 3,000 species are known, the greater number inhabitants of tropical countries, though species are found in almost all parts of the world. Some tropical species are among the largest of beetles; those in colder regions are comparatively small. The tribe is divided into six sections: *Coprophagi* (dung-eaters), *Arenicoli* (dwellers in sand), *Xylophili* (delighting in wood), *Phyllophagi* (leaf eaters) *Anthobii* (living on flowers), and *Melitophili* (delighting in honey), named according to prevalent and characteristic habits of the species belonging to them; though the names do not accurately denote the habits of all the species of each section. The sections are distinguished by differences in the organs of the mouth and the antennæ. To the section *Coprophagi* belong the greater number of the Dung Beetles (q.v.), or Scavenger Beetles, so useful in warm countries in removing offensive matter; among which is the Sacred *Scarabæus* of the anc. Egyptians (*Scarabæus* or *Ateuchus sacer*). Some of the *Xylophili*, as the great Hercules Beetle (q.v.), have remarkable projections from the head of the thorax of the males. The Cockchafer (q.v.) is an example of the *Phyllophagi;* the Goliath Beetle (q.v.) is one of the *Melitophili*, to which section the Rose Beetle also belongs.

SCARABÆUS, *skăr-a-bē'ŭs :* beetle held sacred by the Egyptians, commonly known in entomology as the *Scarabæus* or *Ateuchus sacer ;* called *Heliocantharus* or *Cantharus,* by the Greeks, and S. by the Latins. Scarabæi were employed for rings, necklaces, and other purposes by the Egyptians, Phœnicians, and Etruscans (see GEM). These are distinguished by the absence or presence of striated elytra and other marks. Entomologists have recognized four distinct species of the *Ateuchus* on Egyptian monuments; viz., *A. semipunctatus, A. laticollis, A. morbillosus, A. puncticollis.* Several mystical ideas were attributed to the S.: the number of its toes, 30, symbolized the days of the month; the time it deposited its ball in which its eggs were deposited was supposed to refer to the lunar month; the movement of the clay-ball referred to the action of the sun on the earth, and personified that luminary. The S. was supposed to be only of the male sex; hence it signified the self-existent, self-begotten, generation or metamorphosis, and the male or paternal principle of nature. In this sense it appears on the head of the pygmean deity, Ptah-Socharis Osiris, the demiurgos, and in astronomical scenes and sepulchral formulas. In the hieroglyphs it is used for the syllable *khepru,* and expresses the verb 'to be, exist.' In connection with Egyptian notions, the Gnostics and some of the Fathers called Christ the Scarabæus. The insect, during its life, was worshiped, and after death, embalmed.—*Horapollo,* i.c. 10; Ælian *De Nat. Anim.* x. 15; Pettigrew, *History of Mummies,* 221; Wilkinson, *Man. and Cust.* v. 255

Scarabæus.

SCARAMOUCH, n. *skăr'ă-mowch* [F. *scaramouche :* It. *scaramuccia,* a skirmish—from a famous Italian buffoon, who d. Paris 1694]; a character in the old Italian comedy, originally derived from Spain, representing a military poltroon and braggadocio. He was dressed in a sort of Hispano-Neapolitan costume, including a black *toque* and mantle, and a mask open on the forehead, cheeks, and chin; and always received an inglorious drubbing at the hands of harlequin.

Scaramouch.

SCARBOROUGH, *skâr'brŭh* or *skâr'bŭr-ŭh* (i.e., fortified rock); English seaport and municipal and parliamentary borough on the e. coast of Yorkshire, in the N. Riding; 42 m. n.e. of York, about 20 m. n.w. of Flamborough Head. It is built around a charming bay open to the s. and s.w. and protected on the n.e. by a promontory ending in a castle crowned height which looks out on the North Sea. From the sands the town has gradually climbed the rising ground behind in successive terraces and crescents. The chief buildings are churches, chapels and

benevolent and other institutions, with which the town is well furnished. A fine cast-iron bridge, 75 ft. high, over a chasm 400 ft. wide, connects the old and new towns, and leads to the spa; and a bridge was erected 1865 over a picturesque ravine to connect the w. part of the town with its large and fashionable s. suburb. The springs, saline aperient, and chalybeate, are on the margin of the sea, and are surrounded by walks and ornamental grounds. S. however is now resorted to not so much for the springs as for sea-bathing. In winter it is only 0.6° cooler than Brighton; in summer it is 3.6° cooler. The harbor, composed of three piers, and furnished with a light-house, is the most important in this part of the e. coast. Every accommodation is offered to visitors for sea-bathing; S. is reputed a most fashionable watering-place, and during the season, May—Oct., its pop. is increased about 20,000. Including all who come for a short stay, excursionists, etc., the place is said to have about 200,000 visitors in the year. The Grand Hotel on St. Nicholas Cliff fronting the South Bay, is one of the largest hotels in England. The south side is deemed the most attractive; but the north side also has a fine beach, and a promenade pier. An active coasting trade and fisheries are carried on and jet articles are manufactured. The castle was erected about 1136. It was held against the barons by Piers Galveston, who, however, surrendered, and it was twice besieged by the parliamentary forces. At present it is a barrack, fortified by batteries.—Pop. 38,200.

SCARCE, a. *skärs* [OF. *escars* or *eschars*, sparing, niggardly; *escharcer*, to diminish: It. *scarso*, scarce, scant: Bret. *skarz*, slender, little; *skarza*, to spare, to diminish]: in small quantity compared to the demand; not common; few in number, and scattered; not often found or met with; in *OE.*, not liberal; stingy; parsimonious. SCARCE'LY, ad. *-lĭ*, hardly; with difficulty. SCARCE'NESS, n. *-nĕs*, or SCARCITY, n. *skärs'ĭ-tĭ* [OF. *escarsete*]: the condition of being scarce; deficiency.—SYN. of 'scarce': infrequent; rare; deficient; uncommon;—of 'scarcity': want; lack; dearth; penury; rarity; infrequency.

SCARCEMENT, *skärs'mënt:* plain set-off or projection in a wall: foundations have generally one or more scarcements.

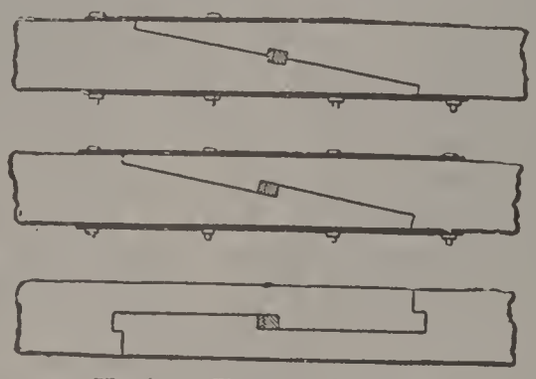
SCARD, n. *skârd* [see SHARD]: a shard; a fragment.

SCARE, v. *skär* [Scot. *skair*, to take fright: Icel. *skiarr*, timid, shy: Norw. *skjerra*, to frighten, to scare]: to terrify suddenly; to frighten. SCAR'ING, imp. SCARED, pp. *skärd*. SCARECROW, anything set up in a field or garden to frighten away birds; any vain terror.

SCARF, n. *skârf* [AS. *scearfe*, a fragment: Dut. *scherf* a shred: OF. *escharpe*, a beggar's scrip or bag, a scarf; Ger. *scherbe*, a scarf, a fragment]: a sort of oblong shawl thrown loosely over the neck and shoulders; a kind of neck-tie or sash; in *her.*, small ecclesiastical banner suspended from the top of a crosier: plu. SCARFS, *skârfs*, or SCARVES, *skârvz*. SCARF, v. in *OE.*, to throw on as a scarf; to bandage. SCARF'ING, imp. SCARFED, or SCARFT, pp. *skârft*.

Scarf.

SCARF, v. *skârf* [Sw. *skarfwa*, to piece out: Dan. *skarre*, Norw. *skara*, to scarf timber: Icel. *skera*, to shape: Sp *escarpar*, to rasp, to slope down a bank, to scarf timber] to unite two pieces of timber at the ends by a sort of dove-



Various Forms of Scarfs.

tailing; to join or piece. SCARF'ING, imp.: N. the process of joining two pieces of timber by notching their ends into each other. SCARFED, pp. *skârft*.

SCARFSKIN, n. *skârf'skĭn* [Bav. *schurffen*, to scratch or peck off the outside of a thing, and Eng. *skin* (see SCURF)]: the outer thin integument of the skin; the cuticle or epidermis.

SCARIDÆ, *skăr'ĭ-dē:* family of teleost fishes, erected out of genus *Scarus:* see LABRIDÆ: PARROT-FISH.

SCARIFY, v. *skăr'ĭ-fī* [F. *scarifier*—from L. *scarificārĕ*, to scratch open: Gr. *skariphaomai*, I make a scratch with a sharp-pointed instrument—from *skarīphos*, a pointed instrument: It. *scarificare*]: to scratch or cut slightly the skin of an animal by means of a lancet so as to draw blood from the minuter vessels only. SCAR'IFYING, imp. SCAR'IFIED, pp. *-fīd*. SCAR'IFIER, n. *-fī-ĕr*, one who scarifies; an instrument used for scarifying; in *agri.*, an implement with prongs used for stirring the soil. SCAR'IFICA'TION, n. *-fĭ-kā'shŭn* [F.—L.]: incisions in the skin with a lancet or like instrument. SCAR'IFICA'TOR, n. *-kā'tĕr*, an agricultural instr. for stirring and loosening the soil without turning it over; an instr. containing lancets for cupping.

SCARIOUS, a. *skā'rĭ-ŭs*, or SCA'RIOSE, a. *-ōs:* in *bot.*, having the consistence of a dry scale; membranous, dry, and shrivelled.

SCARLATTI, *skâr-lât'tē,* ALESSANDRO: musician of great eminence: 1659-1725, Oct. 24; b. Trapani, in Sicily. He is said to have studied under Carissimi; if so, it must have been when very young. In 1680 Scarlatti visited Rome, and composed his first opera, *L'onestà nell' amore,* performed first at the court of Queen Christina of Sweden. His opera *Pompeo* was performed at Naples 1684. In 1693 he composed the oratorio, *I Dolori di Maria sempre Vergine,* and the opera *Teodora,* in which first were introduced orchestral accompaniments to the recitatives, and a separate design given to the accompaniments to the airs. In the following eight years, during part of which time he held the office of *maestro di capella* at Naples, he produced various operas, the most remarkable being *Laodicea e Bereniee* 1701. 1703-09 he was *maestro di capella* at Santa Maria Maggiore at Rome; he then returned to Naples; and 1715 produced *Il Tigrane.* His musical works comprise 117 operas, several oratorios, and a great deal of church music, besides various madrigals and other chamber music. He was the founder of the Neapolitan school, in which were trained most of the great musicians of the 18th c., and whose influence can be traced in the works of almost every composer who has flourished since. His invention was rich and bold, his learning great, and his style pure. His modulations, often unexpected, are never harsh, and never difficult for the voice. Very few of his works have been published.—His son, DOMENICO SCARLATTI (1685-1757), was the first harpsichord player of his day: among his compositions are sonatas remarkable for invention, graceful melody, and skilful construction.—Domenico Scarlatti had a son, GIUSEPPE SCARLATTI (1718-96), also an eminent musician.

SCARLET, n. *skâr'lĕt* [F. *écarlate;* OF. *escarlate;* It. *scarlatto;* Ger. *scharlach,* scarlet]: a bright red color, brighter than crimson: ADJ. of the color of scarlet. Scarlet color for dyeing is furnished generally by Cochineal (q.v.), which is very extensively used; a solution of tin and cream of tartar is employed as the mordant to fix it. Scheffer, who produced the best formula for dyeing this color, added starch, the proportions being as follows for 100 lbs. of wool or cloth: Starch, 9 lbs.; cream of tartar, 9 lbs. 6 oz.; solution of tin, 9 lbs. 6 oz.; and cochineal, 12 lbs. 4 oz. SCARLET BEAN or RUNNER, a plant, so called from the color of its flowers; the *Phaseŏlus multĭflōrus,* ord. *Legum'inōsæ,* sub-ord. *Papilĭonācĕæ* (see KIDNEY BEAN). SCARLET FEVER, a dangerous and very contagious fever, especially to the young (see SCARLET FEVER). SCARLET OAK, SCARLET BEECH, etc., applied to varieties of those trees having reddish leaves.

SCARLET FEVER, or SCARLATINA: a continued, infectious fever, accompanied by a scarlet rash, by inflammation of the throat, by physical and mental depression, often by suppression of urine, and sometimes followed by an acute inflammation of the kidneys. It chiefly attacks

children, and usually occurs but once in the same person. The second to the fifth years of life are those in which it is most prevalent, but the opinion that the disease does not attack children under two years of age is erroneous. After the tenth year its frequency rapidly declines, nevertheless adults occasionally contract it.

There are three varieties, or more correctly speaking, degrees of intensity. The disease may concentrate its malignancy in the throat, in which event it is known to the medical profession as *scarlatina anginosa.* A second form is *scarlatina simplex,* or the ordinary variety, in which the disease expends itself on the skin. Finally, there is *scarlatina maligna,* or malignant scarlet fever, as it is sometimes termed, in which all the symptoms are much more severe, and the disease may prove fatal. It should not be forgotten that the nervous system, the skin, the mucous lining of the throat, stomach, and bowels, and the kidneys are all more or less involved, but the degree of such involvement may vary widely.

The incubation of scarlet fever lasts five or six days, but may be of only twenty-four hours' duration. The invasion manifests itself suddenly with the ordinary precursors, fever, chills, and shiverings, succeeded by hot skin, nausea, and sometimes vomiting. There is frequently headache and sore throat, the latter being generally the earliest complaint of the patient. In about forty-eight hours after the occurrence of these symptoms a characteristic rash is perceptible, appearing first on the chest, whence it gradually extends to the neck, face, trunk, and then downward over the entire body, until it is completely covered. The eruption is bright scarlet, very much the color of a boiled lobster, and consists of innumerable red points or spots. These spots either run together and diffuse themselves uniformly over the skin, or else appear in large patches on different parts of the body. The color of the skin disappears on pressure, but returns when the pressure is removed. The appearance of the tongue is characteristic in itself; first, the tip and edges become red, the papillæ being raised, and showing through the white fur, giving the appearance known as strawberry tongue. Afterwards this white fur clears off, and the tongue becomes clean and raw looking. A diffused redness, sometimes of a dark claret color, covers the mouth and sides of the throat, which disappears as the fever and rash subsides. After about the fifth day the redness of the skin begins to decline and rapidly disappears about the eighth or tenth day, leaving the patient in a weakened condition. The subsequent process of desquamation, or shedding of the skin, is variable in its duration, sometimes occurring during the third week, but often later. It takes place in the form of fine, branny scales on the body, but from the hands and feet it often separates in large patches. It is not always, however, that the disease pursues this uniform course.

When the poison does not expend itself entirely upon the skin, and the disease is not eradicated in that way, various complications may result. First among them in importance is *nephritis*, or inflammation of the kidney. This complication is manifested by the presence of dropsy, which may affect the entire body, or be noticeable only in the hands and feet, or by a puffiness about the eyes on awakening in the morning. It is believed now that very many cases of Bright's disease have their incipiency in the inflammation started in one or both of the kidneys during an attack of scarlet fever. Another important, but common, complication is inflammation of the middle ear, often resulting in a chronic suppuration with persistent discharge. Inflammation, often with suppuration, of the submaxillary glands may also accompany or follow scarlet fever. In the malignant form there may be cerebral complications, which, of course, are exceedingly dangerous.

In an uncomplicated case of scarlet fever recovery may be looked for in four or five weeks, but six weeks is a safe limit to insist upon before the patient should be allowed any exposure to changes of temperature. The patient should not be allowed to mix with well children until the peeling of the skin has entirely ceased. During this period it is well to anoint the skin with vaselin to keep the bits of skin, which carry infection, from being scattered about.

SCARLET LETTER, The: a novel by Nathaniel Hawthorne published in 1850. The scene is in Boston about the middle of the 17th century. The chief characters are Hester Prynne; her lover, Arthur Dimmesdale, the young but revered minister of the town; their child, Pearl; and her husband, Roger Chillingworth, an aged scholar, who had sent his young wife Hester to the New World before him. At the beginning of the tale Chillingworth arrives in Boston, to find her upon the pillory, her babe in her arms and upon her breast the Scarlet Letter 'A' ('Adulteress'), which she has been condemned to wear for life.

SCAR'LETT, Sir James Yorke: English soldier: b. 1799; d. Dec. 1871. He was educated at Eton and Cambridge, entered the army, and in 1854 was sent to the Crimea in command of the heavy brigade. On Oct. 25 he led the brigade in its famous charge at Balaclava, and later in the day it brought out of action the remnants of the light brigade after its even more famous charge. For these services he was promoted to the rank of major-general, on Dec. 12 following, and upon the retirement of Lord Lucan took command of the entire cavalry forces in Crimea. In July, 1855, he was created a K. C. B. He commanded the camp at Aldershot 1865-70.

SCARMOGE, n. *skar'moj*, Scar'moges, n. plu. *-mō-jēz;* OF. for Skirmish; Skirmishes.

SCARP, n. *skârp*, or ESCARP [F. *escarpe;* Sp. *escarpa;* It. *scarpa*, the slope of a wall or steep front of a fortification]: the interior slope in a ditch before a fortified place: V. to cut down so as to make perpendicular, or nearly so, as to *scarp* a rock or a ditch. SCARP'ING, imp. SCARPED, pp. *skârpt:* ADJ. having a steep face; worn or cut down like the scarp of a fortified place. See ESCARP.

Scarp.

SCARP, n. *skârp* [see SCARF 1]: shoulder belt or scarf worn by military commanders in *her.*, diminutive of the bend sinister, being half the breadth of that ordinary.

SCARPA, *skâr'pâ*, ANTONIO: anatomist, ; 1747, June 13—1832, Oct. 30; b. Castello-Motta, village in the Friuli, n. Italy. He was educated at Padua, where he acted as sec. to the octogenarian Morgagni, who had lost his sight, and with whom S. read the Latin authors—gaining an elegant Latin style. In 1772, he was appointed prof. of anatomy in Modena; and in 1783, at Pavia. He became one of the great clinical surgeons in Europe. S. published in rapid succession medical treatises, which, especially one on the innervation of the heart, gave him wide repute. But his greatest achievement was on Hernia (1809). His last three years were spent in total blindness. He died at Pavia.

SCARPANTO, *skâr'pân-tō* (anc. *Carpathos*): island in the Mediterranean, belonging to Turkey, midway between the islands of Rhodes and Crete; 32 m. long, about 8 m. in extreme breadth, and its surface is covered with bare mountains, which reach the height of 4,000 ft. Ruins of towns, in several places, indicate that formerly the island was well peopled. The people are now mostly workers in wood. Pop. about 5,000.

SCARRON, *skâ-rōng'*, PAUL: poet, dramatist, and novelist, creator of French burlesque: 1610, prob. July 4—1660, Oct. 6; b. Paris; son of a counselor of parliament, a man of fortune and good family. About 1634, S. visited Italy, where he made the acquaintance of Poussin the painter. On his return to Paris, he delivered himself over to a life of very gross pleasure, the consequence of which was that, in less than four years, he was seized with permanent paralysis of the limbs. What makes this incident in his career still interesting is the fact that it undoubtedly exercised no inconsiderable influence on the development of his peculiar genius, which, as a French critic justly says, was 'the image of his body.' His love of burlesque, of malicious buffoonery, of profane gayety, was his way of escape through the gates of mockery from the *tourmens vehemens* of his incurable ailment. His scramble for the means of living may be partly excusable in view of his hapless infirmity He wrote verses, flattering dedications, begging-letters for pensions, etc.; and 1643 he even managed to get a benefice at Mans, which he held three years, when he returned to Paris, and lived in a sort of elegant

Bohemian style. He had a pension from Mazarin of 500 crowns; but having, in a fit of absurd indignation, lampooned Mazarin with spleenful virulence, he lost the pension.

It might have fared hard with the physically helpless poet, had other friends not started up—e.g., Fouquet, who granted him a pension of 1,600 crowns—and had he himself not been a most consummate beggar. He would take any conceivable gift, large or small; nothing came amiss. His importunities were so pleasantly worded that they did not estrange the friends on whom he fastened. In 1652 S. married Françoise d'Aubigné—a girl of 17, who subsequently became the mistress of Louis XIV., the famous Madame Maintenon (q.v.). It is a proof of the charm of his company that his rooms were frequented by most of the men and women of his day who were distinguished either in literature or society. Among his works are *Le Typhon, Virgile Travesti* (Par. 1648–52), *La Mazarinade* (1649), *La Baronade Léandre et Héro, Ode Burlesque, La Relation du Combat des Purques et des Poëtes sur la Mort de Voiture, Poésies Diverses* (Par. 1643–51), comprising sonnets, madrigals, epistles, satires, songs, etc.; *Le Roman Comique* (Par. 1651), a most amusing account of the life led by a company of strolling players—it is the best known, and probably the best, of all S.'s productions (repub. by Victor Fournel, 1857); *Nouvelles Tragicomiques*, from one of which (*Les Hypocrites*) Molière took the idea of Tartufe; besides a number of clever but coarse comedies. The editions of his works are very numerous; the best is that of Bruzen de la Martinière (Amster., 10 vols, 1737; Par. 7 vols. 1786).

SCART, n. *skârt*, sometimes SCARF, n. *skârf* [Icel. *scarfr;* Gael. *sgarbh*]: in *Scot.*, a cormorant.

SCAT, or SCATT, n. *skăt* [Icel. *skattr;* Dan. *skat;* AS. *sceat*, money, a tax]: in *Orkney* and *Shetland*, the name of a certain tax on land. TO PAY SCAT AND LOT, to pay shares in proportion; same as SCOT AND LOT. SCATHOLD, n. *skăt'hōld*, open ground for pasture, or for peats.

SCATCHES, n. plu. *skăch'ĕz* [F. *échasses*, stilts: O.Flem. *schætse*]: stilts for walking in dirty places.

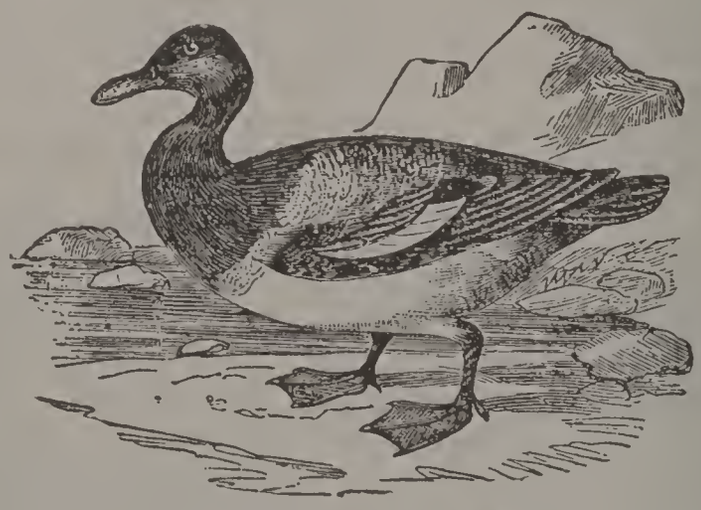
SCATH, or SCAITH, or SCATHE, n. *skāth* [Goth. *skathjan;* Ger. and Dut. *schaden*, to injure: Icel. *skadi;* AS. *sceatha*, damage, hurt: comp. Gael. *sgàth*, to destroy]: damage; injury; harm; in *OE.*, waste; depopulation. SCATHE, or SCAITH, v. to damage; to injure. SCATH'ING, imp. SCATHED, pp. *skāthť*. SCATHFUL, a. *skāth'fûl* in *OE.*, mischievous; destructive. SCATH'LESS, a. *-lĕs*, without damage or injury.

SCATTER, v. *skăt'tĕr* [Dut. *schetteren*, to resound, to scatter: AS. *scateran*, to scatter]: to throw loosely or thinly about; to strew; to disperse or dissipate; to be dispersed. SCAT'TERING, imp.: ADJ. dispersing among many: N. act of dispersing or distributing; something scattered, generally in plural, SCATTERINGS. SCAT'TERED, pp. *-tĕrd:* ADJ. dispersed; thinly spread; dissipated; in *bot.*, without apparent symmetry in arrangement. SCAT'TEREDLY, ad. *-tĕr-ĕd-lĭ*, in a scattered manner; dispersedly. SCAT'TERINGLY, ad. *-lĭ*, in a scattered or dispersed manner. SCAT'TERGOOD, n. one who wastes; a spendthrift.—SYN. of 'scatter': to spread; disperse; sprinkle; dissipate; strew.

SCATTERY ISLAND, *skăt'tĕh-rĭ:* small islet in the estuary of the Shannon, Ireland; three m. s.w. of the town of Kilrush. Besides a fort, the islet contains fragments of several small churches, and an ancient round tower 120 ft. high.

SCAUP, n. *skawp* [a corruption of SCALP, which see]: in *Scot.*, very poor land; a sea-fowl: see SCAUP DUCK.

SCAUP DUCK, *skawp dŭk* (*Fuligula*—or *Nyroca*—*marila*): oceanic species of duck, of the same genus with the Pochard (q.v.), inhabitant of the n. parts of the world, spending the summer in arctic or subarctic regions, and visiting the coasts of Europe as far s. as the Mediterranean in winter. It is seen in winter in great flocks in the United States, not only on the sea-coast, but also on the Ohio.



Scaup Duck (*Fuligula marila*).

Mississippi, and other rivers. It breeds in fresh water swamps. In size it is nearly equal to the Pochard. The male has the head, neck, and upper part of the breast and back black, cheeks and sides of the neck glossed with rich green; back white, spotted and striped with black lines; wing-coverts darker than the back, speculum white; rump and tail-coverts black. The female has brown instead of black, and old females have a broad white band around the base of the bill. The flesh is tough, and has a strong fishy flavor.

SCAUR: see SCAR 3.

SCAVENGER, n. *skăv'ĕn-jĕr* [OE. *scavage*, originally the inspection of customable goods brought to market within the city of London; *scavagers*, officers whose duty it was to take custom upon the *scavage*, afterward applied to inspectors of the streets, then to the cleaners—from AS. *sceawian*, to view, to inspect, to show: *scavenger* stands for *scavager* as *passenger* for *passager*]: one employed in cleaning streets; one engaged in a mean or dirty occupation: V. to clean streets or dirty places. SCAV'ENGERING, imp. SCAV'ENGERED, pp. *-jĕrd*.

SCEATTÆ: see NUMISMATICS.

SCENE, n. *sēn* [F. *scène*—from L. *scēna;* Gr. *skēnē*, the stage, the scene of a theatre: It. *scena*]: many objects, actions, and events, forming one whole, displayed at one view: the place of action or occurrence; the stage of a theatre; a part of a play; in a *theatre*, the place where the action passes; certain stage paintings, etc.; an exhibition of strong feeling between two or more persons; a large painted view generally; the place where anything has been done or suffered. SCENA, n. *sā'na* [It.]: a scene or portion of an opera; solo for a single voice, in which various dramatic emotions are displayed. SCENARIO, n. *sĕ-nâ'rĭ-ō* [It.]: preliminary sketch of the scenes and main points of an opera libretto or a play (also see THEATRE). SCENERY, n. *sēn'ĕr-ĭ*, the general appearance of a district of country; a widely extending panoramic view of the beauties or grandeur of nature; the painted representation of places, etc., used on the stage. SCENIC, a. *sēn'ĭk* or *sĕn'ĭk*, or SCEN'ICAL, a. *-ĭ-kăl*, pertaining to scenery; dramatic. SCEN'ICALLY, ad. *-lĭ*. SCENE-SHIFTER, one who changes the scenes of a theatre when needed.

SCENOGRAPHIC, a. *sēn'ō-grăf'ĭk*, or SCEN'OGRAPH'ICAL, a. *-ĭ-kăl* [Gr. *skēnē*, a scene; *graphō*, I write]: drawn in perspective. SCEN'OGRAPH'ICALLY, ad. *-lĭ*. SCENOG'RAPHY, n. *sēn-ŏg'rā-fĭ*, the art perspective.

SCENT, n. *sĕnt* [F. *sentir*, to feel, to smell—from L. *sentīrĕ*, to discern by the senses: the *c* in *scent* is intrusive]: that which proceeds from a body and affects the olfactory nerves; smell, good or bad; perfume (see PERFUMERY); odor: power of smell; course of pursuit by smell; track: V. to perceive by the olfactory nerves; to smell; to perfume. SCENT'ING, imp. SCENT'ED, pp.: ADJ. perfumed; imbued with odor. SCENT'LESS, a. *-lĕs*, without scent. ON THE RIGHT SCENT, on the track that leads to the object aimed at—alluding to dogs following game by scent.

SCEPTIC, SCEPTICISM, etc.: see SKEPTIC.

SCEPTRE, *sĕp'tĕr* [F. *sceptre*—from L. *sceptrum*, a royal staff, a sceptre—from Gr. *skēptron*, a staff to lean upon, a sceptre—from *skēptō*, I lean]: originally a staff or walking-stick, hence in course of time, also a weapon of assault and of defense. At a very early period the privilege of carrying it came to be connected with the idea of authority and station. Both in the Old Test. and in Homer, the most solemn oaths are sworn by the S., and Homer speaks

of the S. as an attribute of kings, princes, and leaders of tribes. According to Homer, the S. descended from father to son, and might be committed to any one to denote the transfer of authority. Among the Persians, whole classes of persons vested with authority, including eunuchs, were distinguished as the 'sceptre-bearing classes.' The S. was in very early times a truncheon pierced with gold or silver studs. Ovid speaks of it as enriched with gems, and made of precious metals or ivory. The S. of the kings of Rome, afterward borne by the consuls, was of ivory surmounted by an eagle. While no other ensign of sovereignty is of the same antiquity, it has kept its place as a symbol of royal authority through the middle ages and to the present time. There has been considerable variety in its form: the S. of the kings of France of the first race was a gold rod as tall as the king himself. SCEP'TRELESS, a. *-lĕs*, without kingly power. SCEP'TRED, a. *-tĕrd*, invested with the ensigns of royalty; bearing a sceptre.

SCHADOW, *shä'dō*, GODENHAUS FRIEDRICH WILHELM VON: distinguished German painter, of the Düsseldorf school; 1789, Sep. 6—1862, Mar. 19; b. Berlin; son of Johann Gottfried S. (1764—1850, b. Berlin, eminent sculptor, director of the Berlin Acad. of Arts). During young S.'s first visit to Rome, the influence of Overbeck, Cornelius, Führich, Veit, etc., awoke his dormant genius, and both singly and in company with some of these artists, he executed several pictures remarkable for depth of religious sentiment: e.g., *An Explanation of the Dream of Joseph*, and *The Grief of Jacob when told of the Death of his Son*. While in Rome he became a Rom. Catholic. Returning to Berlin he was appointed prof. of the Acad., and soon gathered round him a host of brilliant pupils; but 1826 he went to Düsseldorf as successor of Cornelius in the direction of the notable academy there. His pupils followed him; and ever since the 'Düsseldorf School' has been associated specially with their names. S.'s principal works are *Mignon* (1828), *The Four Evangelists*, *The Wise and Foolish Virgins*, *The Source of Life*, *The Assumption*, and *Heaven*, *Purgatory*, and *Hell*. S. was ennobled 1843. *Der Moderne Vasari* (1854) is a book from his hand.

SCHAFF, *shäf*, PHILIP, S. T. D., LL.D.: theologian and author: 1819, Jan. 1—1893, Oct. 20; b. Switz. His education, begun at home, was pursued in the Stuttgart Gymnasium, and the universities of Tübingen, Halle, and Berlin. After travelling as private tutor of a nobleman, he was lecturer on church history and biblical exegesis in the Berlin Univ. two years. Called to a chair in the Mercersburg Theol. Seminary, Penn. German Ref.), he came 1844, and the next year was tried and acquitted of a heresy which proved to be good old wine in new bottles. In 1863 he came to New York where he thereafter resided, at first as sec. of the N. Y. Sabbath Committee, 1864–69, and lecturer on church hist. at Union Theol. Seminary, New York, and at Hartford and Andover theol. seminaries. In 1870 he became prof. of sacred literature in the Union Theol.

Seminary. He was very prominent in the work of the Evangelical Alliance and of Bible revision, having been a founder and hon. sec. of the former, in behalf of which he has repeatedly visited Europe. He was pres. of the Amer. Bible Revision Committee. While he was in service at Mercersburg, he represented the Germ. Ref. churches as delegate to Frankfort and Basel; and later, 1875, had part in the Old Catholic, Greek, and Protestant conference at Bonn. He helped organize, and was first pres. of the Amer. Soc. of Church Hist. He was very energetic, and known for his genial vivacity, wide learning, and boundless literary activity. His numerous works include *Hist. of Apostolical Christianity* (1853); *Sketch of the Political, Social, and Religious Character of the United States* (1855); *Germany, its Universities, Theology, and Religion* (1857); *Hist. of the Christian Church* (1858–88); *The Christ of the Gospels* (1864); *The Person of Christ, with Replies to Strauss and Renan* (1865); *Revision of the Eng. Version of the N. Test.* (1874); *The Vatican Council* (1875); *History and Collection of the Creeds of Christendom* (1876); *Harmony of the Ref. Confessions* (1877); *Through Bible Lands* (1878); *Dic. of the Bible* (1880); *Companion to the Gr. Test. and the Eng. Version* (1883); *Hist. Account of the Work of the Amer. Revision Committee* (1885); *Christ and Christianity* (1885); *Church and State in the United States*, etc. (1888); *The Renaissance: Revival of Learning and Art in the Fourteenth and Fifteenth Centuries* (1891), also works on religious poetry and Germ. hymns. He edited the Amer. ed. of *Lange's Commentary*, and was co-editor of the *Philos. and Theol. Library;* he also edited several periodicals and contributed largely to periodical and cyclopedic literature. He was editor of the *Schaff-Herzog Cyclopædia of Biblical Literature.*

SCHAFFHAUSEN, *shâf-how'zên:* most northern canton of Switzerland, bounded on all sides but the s. by the duchy of Baden; 112 sq. m. The chief river is the Rhine, which forms part of the s. boundary, and within whose basin the canton is wholly included. The surface is hilly, especially in the n. and e., and of the many rich valleys that slope s. to the Rhine, that of the Klettgau is famous for unusual fertility, and for its wines, whose bouquet is peculiarly fine. The climate is mild; the soil, mostly calcareous, is generally fruitful, and agriculture is the principal industry. Grain, fruits, flax, hemp, and wine are the chief crops. Iron is obtained. The sovereignty is usually exercised by the great council of 600 members, wholly renewed by ballot every 4 years; but the people have the right of veto. S. sends two members to the national council.—Pop. (1880) 38,348, of whom about 34,000 were Protestants; (1888) 37,783; (1900) 41,514.

SCHAFFHAU'SEN: town of Switzerland, cap. of the canton of S.; beautifully situated on the right bank of the Rhine, immediately above the celebrated falls of that river, about 30 m. w. of Constance. Higher up the slope on which the town stands, is the curious castle of Munoth; and this edifice and the minster founded 1052 are the chief buildings. The town is remarkable for antique architecture. The old wall and gateways of S. also are very picturesque. The people are partly engaged in the manufacture of iron, cotton, and silk goods. The *Falls of Schaffhausen*, about three m. below the town, are, perhaps, the most imposing spectacle of the kind in Europe. The river is here 300 ft. broad, and the entire descent is about 100 ft. From a projecting balcony which overhangs the roaring cataract, the visitor may appreciate the full grandeur of the fall.—Pop. 15,400.

SCHAKO: see SHAKO.

SCHALL, *shál*, JOHANN ADAM VON: Jesuit missionary to China: 1591-1669, Aug. 15; b. Cologne, of noble family. He entered the Jesuit order in Rome 1611, and was one of the mission to China 1620. Having turned to good account among the Chinese his familiarity with mathematical and mechanical science, he formed a flourishing mission, and was ultimately invited to the imperial court at Pekin, where he was entrusted with the compilation of the calendar, and the direction of the public mathematical school, being himself created a mandarin. Such was his favor with the emperor, that, contrary to all the received etiquette, he had the privilege of free access to the presence of Emperor Chun-Tche, founder of the Tartar dynasty (1645), and was honored by visits from the emperor at four stated times in each year. Through this favor with the emperor, S. obtained an edict which authorized the building of Rom. Cath. churches, and the liberty of preaching throughout the empire; and in 14 years the Jesuit missionaries in the several provinces are said to have received into the church 100,000 proselytes. On the death of this emperor, however, a change of policy fatal to the prospects of Christianity took place. The favorable edict was revoked; S. was thrown into prison and sentenced to death. He was afterward liberated, but was again imprisoned till his death. He had acquired mastery of the Chinese language, in which he compiled numerous treatises on scientific and religious subjects. A large MS. collection of his remains in Chinese, 14 vols. 4to, is preserved in the Vatican Library. He translated into Chinese several works, doctrinal and medical.—See Mailly's *Histoire Générale de la Chine* and Huc's *Le Christianisme en Chine*.

SCHAM'YL: see SHAMYL.

SCHANDAU, *shán'dow:* town in Saxony, on the Elbe river, 21 m. s.e. from Dresden, 4 m. from the boundary line of Bohemia. It is in a region of beautiful and impressive scenery, known as the Saxon Switzerland; and is visited every summer by several thousand tourists. Permanent pop. about 3,000.

SCHÄSBURG, or SCHÄSSBURG, *shĕs'bûrch* (Magyar, *Segesvár*): town of Austria, in Transylvania, on the Great Kokel. It consists of the Burg or Upper-Town and the Lower-Town. Pop. about 10,000.

SCHAUFFLER, *showf'flĕr*, WILLIAM GOTTLIEB, D.D., LL.D., PH D.: 1798, Aug. 22—1883, Jan. 26; b. Stuttgart, Germany. When he was six years of age he was taken by his parents to Odessa, Russia, where he remained more than 20 years. He was confirmed in the Lutheran Church 1813, but took no special interest in religious matters till 1820, when he resolved to become a missionary. His education was very limited, and, after spending some time in Turkey with Joseph Wolff, he was induced by Rev. Jonas King (of Smyrna) to come to this country. He remained here five years, part of the time working at his trade of turner, and giving the remainder to study. He graduated from the Andover Theol. Seminary, and after giving a year to study of various languages was sent to Paris by the Amer. Board for study of the Persian, Arabic, and Turkish languages under competent teachers. He then went to Constantinople, where he was active in mission work; and, for the benefit of the Jews, in whom he was greatly interested, revised the Old Testament in Spanish, giving the Hebrew in parallel columns. The Brit. and Foreign and the Amer. Bible Societies commissioned him to translate the Bible into the Osmanli-Turkish language. To this great work he gave 18 years of unremitting toil, and on its completion received the degree D.D. from the University of Halle 1867, and 10 years later that of LL.D. from Princeton College. He was master of 19 languages, and in 6 of them was able to preach extemporaneously. He published in Spanish a grammar of the Hebrew language, and a Hebrew and Chaldee lexicon of the Old Test. A collection of his sermons, preached in Constantinople, and printed in Boston 1837, with the title *Meditations on the Last Days of Christ*, has passed through several editions. He died in New York.

SCHAUMBURG-LIPPE, *showm'bûrch-lĭp'pĕh*: sovereign German principality, the w. part of the former county of Schaumburg; bounded w. by Westphalia, and n. by Hanover; 170 sq. m. Till 1866, the constitution was on the ancient patriarchal basis; but since then, S.-L. has a representative diet of 15 members, 10 elected by the towns and the country districts, the rest by the prince, the nobility, and the clergy and educated classes. It has one vote in the federal council of the German empire, and sends one deputy to the Reichstag. The revenue of S.-L. 1882–3 was about $132,000; the expenditure balanced it. The debt amounted to about $90,000, besides about $272,160 as quota toward the paper money of the empire. Pop. (1880) 35,374; (1890) 39,183; (1900) 43,132.

SCHAW, or SHAW, n. *shaw* [Icel. *skogr;* Dan. *skov*, a wood: Dut. *schawe*, shade, shelter]: in *OE.*, and *Scot.*, a wood or thicket; the shade and shelter of the woods.

SCHEDULE, n. *skĕd'ūl*, in England *shĕd'ūl* [L. *sched'ŭla*, a small leaf of paper—from *schĕda*, a sheet or leaf of paper—from *scindo*, I split: OF. *schedule*]: a sheet of paper or parchment containing a written or printed list, inventory, or table; a list or inventory attached to another document; a little inventory: V. to catalogue; to put or place in a list. SCHED'ULING, imp. SCHED'ULED, pp. *-ūld*.

SCHEELE, *shā'lĕh*, Sw. *shĕ'lĕh*, KARL WILHELM: Swedish chemist: 1742, Dec. 19—1786, May 21; b. Stralsund. After an incomplete education, he was apprenticed to an apothecary at Gothenburg, where he laid the foundation of his knowledge of chemistry. In 1767 he settled at Stockholm as apothecary; and 1770 removed to Upsala, where Bergmann was prof. of chemistry. Here he carried on investigations in chemical analysis which proved fruitful in important discoveries and placed their author by the side of Linnæus and Berzelius, his countrymen—in the front rank of science. In 1777 he removed to Köping. The chief of his discoveries were tartaric acid (1770), chlorine (1774), baryta (1774), oxygen (1777), and glycerine (1784). Oxygen had been previously made known through the labors of Priestley, though S. was not aware of this till after his own discovery. In experimenting on arsenic and its acid, he discovered the arsenite of copper, known as a pigment under the name *Scheele's Green* or *Mineral Green*. In 1782, during a delicate and subtle investigation to determine the nature of the coloring-matter in Prussian Blue, he obtained, for the first time, prussic acid in separate form.—See his work *Air and Fire* (1777), and communications to the Acad. of Stockholm.

SCHEELE'S GREEN, n. *shēlz' grēn* [after *Scheele*, Swedish chemist]: green pigment, consisting of an arsenite of copper, first prepared by Scheele, much used as an oil and water color (see ARSENIOUS ACID). SCHEELETINE, n. *shĕ'lĕ-tĭn*, a mineral of a green, yellow, brown, or red color, being a native tungstate of lead, and consisting of tungstic acid and lead. SCHEEL'ITE, n. *-īt*, tungstate of lime, found in the veins of the older rocks in four-sided pyramidal crystals, or in granular crusts of a gray, white, yellow, or brownish color. SCHEE'LIUM, n. *-lĭ-ŭm*, an obsolete name sometimes applied to tungsten.

SCHEERERITE, n. *shēr'ĕ-rīt* [after the discoverer, Von *Scheerer*]: mineral resin occurring in brown coal and peat.

SCHEFFER, *shĕf'fĕr*, F. *shĕfr*, ARY: French painter, 1795, Feb. 10—1858, June 15; b. Dort, Holland. He studied under Guerin of Paris, and made his début as an artist 1812. Some years later appeared his *Mort de Saint-Louis*, *Le Dévouement des Bourgeois de Calais*, and several *genre* pieces, e.g., *La Veuve du Soldat*, *Le Retour du Conscrit*, *La Sœur de Charité*, *La Scène d'Invasion*, etc., popularized in France by engravings; but compared with his later performances, these early pictures have little merit. It was not till the 'Romantic' movement reached art that S. became conscious of his peculiar power. The influence of Goethe and Byron became conspicuous in his choice of

subjects, and to his always remarkable facility of execution he added subtlety and imaginative grace. The public lavished eulogy on his *Marguerite à son Rouet, Faust tourmenté par le Doute, Marguerite à l'Église, Marguerite au Sabbat, Marguerite sortant de l'Église, Marguerite au Jardin, Marguerite à la Fontaine, Les Mignons, Le Larmoyeur, Francesca de Rimini,* etc. Toward 1836, his art underwent its third and final phase—the religious. To this class belong *Le Christ Consolateur, Le Christ Rémunérateur, Les Bergers conduits par l'Ange, Les Rois Mages déposant leurs Trésors, Le Christ au Jardin des Oliviers, Le Christ portant sa Croix, Le Christ enseveli,* and *Saint Augustin et sa Mère Sainte Monique.* S. executed some remarkable portraits; among others, those of La Fayette, Béranger, Lamartine. He died at Argenteuil, near Paris. His sentiment has been criticised as extreme by the best taste of recent years.

SCHEIK: see SHEIK.

SCHELDT, *skĕlt* (or SCHELDE, *skĕl'dĕh*), THE (Lat. *Scaldis*, Fr. *l'Escaut*): river, rising in the French dept. of Aisne, flowing n. to Cambrai, Valenciennes, Bouchain, and Condé (75 m. in France), when, entering Belgium, it passes Doornik, Oudenarde, Ghent, Dendermonde, Rupelmonde, and Antwerp, having received, among other tributaries, the Lys, Dender, and Rupel; total length about 250 m. Navigable from its entrance into Belgium (137 m. in Belgium), the S. at Antwerp becomes a noble river, of sufficient depth (49 ft. at high tide) for large ships. From Antwerp, the course is n.w., to Fort Bath, in the Netherlands (37 m. in the Netherlands), where, at the island of South Beveland, it divides into two arms. The left or s., called the Honte or Wester S., takes a w. direction s. of the islands of Zeeland, and meets the North Sea at Flushing; the n. or right arm, called the Kreekerak, flows between Zeeland and N. Brabant, near Bergen-op-Zoom, dividing again into two branches—the left, called the Easter S., passing between the islands of Tholen and Schouwen on the right, and the Bevelands on the left, reaches the sea through the Roompot (*Romanorum portus*); the other branch, flowing between N. Brabant and Zeeland, discharges itself by several passages. These several mouths of the S., forming various islands, are called the Zeeland streams: the natural channels are so numerous and so intermingled with artificial canals, that the original course of the S. cannot now be discovered. The Easter S., probably the ancient main channel, has since 1867 been almost choked with sands: the Wester S. was probably enlarged by a storm 1173.

The Dutch had long monopolized the navigation of the lower S.; and by the treaty signed in London 1839, the Netherlands secured the right of levying 2*s.* 6*d.* (about 62 cents) per ton on all vessels. By a treaty signed at Brussels 1863, this toll has been bought up, nominally by Belgium, but in reality from a sum of £750,000 (about $3,750,000) paid to that country by the powers whose ships navigate the S., the proportion falling to Great Britain being fully £350,000.

SCHELL, *shĕl*, AUGUSTUS: 1812, Aug. 1—1884, Mar 27; b. Rhinebeck, N. Y. He graduated from Union College 1830, studied law, settled in New York, and secured an extensive practice. He became prominent in politics 1852 as chairman of the Tammany Hall committee and candidate for gov., was chairman of the democratic committee of N. Y. 1853–56, declined the nomination of mayor of New York 1854, was collector of the port of New York 1857–61, engaged in railroad enterprises, was one of the leading members of the committee that revised the state constitution 1867, and 1878 was a defeated candidate for mayor of New York. He was on the board of directors of several large corporations, and was interested in various philanthropic movements. He died at New York.

SCHELLENBERG, *shĕl'lĕn-bĕrch:* village in the s.e. of Upper Bavaria, six m. s.w. of the Austrian town of Salzburg, near which occurred the first battle of the 'War of the Spanish Succession,' in which the English took part, Maximilian-Emmanuel, Elector of Bavaria, had fortified the hill of S. to resist the progress of Marlborough; but 1704, July 4, the work was attacked by the English, led by Prince Ludwig of Baden, and carried by storm after a bloody fight.

SCHELLING, *shĕl'lĭng*, FRIEDRICH WILHELM JOSEPH VON: illustrious German philosopher: 1775, Jan. 27—1854, Aug. 20; b. Leonberg, in Würtemberg. He studied at Tübingen and Leipzig, and 1798 proceeded to Jena, then the headquarters of speculative activity in Germany, through the influence of Reinhold and Fichte. S.'s philosophical tendencies were originally determined by Fichte: in fact, he was at first only an expounder, though an eloquent and independent one, of the Fichtian idealism, as one may see from his earliest speculative writings, *Uber die Möglichkeit einer Form der Philosophie* (On the Possibility of a Form of Philosophy, Tüb. 1795), *Vom Ich als Princip der Philosophie* (Of the Ego as the Principle of Philosophy, Tüb. 1795), and others. Gradually, however, S. diverged from his teacher, and commenced what is regarded as the second phase of his philosophy. Fichte's idealism now seemed to him one-sided and imperfect through its rigorous and exclusive subjectivity, and he sought to harmonize and complete it. The result of his speculations, in this direction, was the formerly famous *Identitätsphilosophie* (Philosophy of Identity), which claimed to show that the only true knowledge, therefore the only philosophy, was that of the Infinite-absolute, in which the 'real' and 'ideal,' 'nature' and 'spirit,' 'subject' and 'object,' are recognized as absolutely the same; and which affirmed the possibility of our attaining to such knowledge by a mysterious process, known as 'Intellectual Intuition.' The 'philosophy of identity,' though only the second stage in S.'s speculative career, is the most important, and is the one by which he became best known in England—Sir William Hamilton having elaborately discussed it, and endeavored to demonstrate its untenableness

in his essay on the 'Philosophy of the Conditioned' (see *Discussions in Philosophy and Literature, Education and University Reform*, 1852). The principal works in which it is more or less completely developed are *Ideen zu einer Philosophie der Natur* (Ideas toward a Philosophy of Nature, Leipz. 1797, 2d ed. 1803); *Von der Weltseele, eine Hypothese der Höhern Physik zur Erläuterung des allgemeinen Organismus* (Of the World-soul, an Hypothesis of the higher Physics in Elucidation of the Universal Organism, Hamb. 1798, 3d ed. 1809); *Erster Entwurf eines Systems der Naturphilosophie* (First Attempt at a Systematic Philosophy of Nature, Jena 1799); and *System des Transcendentalen Idealismus* (System of Transcendental Idealism, Tüb. 1800). In 1803, after the departure of Fichte from Jena, S. was appointed to succeed him, but in the following year went to Würzburg, whence, 1808, he was called to Munich as sec. to the Acad. of Arts, and was ennobled by King Maximilian-Joseph. Here he lived 33 years, during the last 14 of which he occupied the chair of philosophy in the newly established Univ. of Munich; but 1841 he accepted a call from Friedrich-Wilhelm IV. to Berlin, where mainly he resided for the rest of his life. He died at the baths of Ragaz, in Switzerland.

We revert to S.'s philosophical career. Its third period, if not its third phase, is marked chiefly by incessant controversy. Except *Bruno, oder über das Göttliche und Natürliche Princip der Dinge* (Bruno, a Dialogue concerning the Divine and Natural Principle of Things, Berl 1802), and *Vorlesungen über die Methode des Akademischen Studiums* (Lectures on the Method of Academical Study, Stuttg. and Tüb. 1803), most of S.'s writings are polemical —often hotly so. The most notable are: *Philosophie und Religion* (Tüb. 1804), in reply to Eschenmayer; *Denkmal der Schrift von den Göttlichen Dingen* (Tüb. 1812), in reply to Jacobi; and *Darlegung des Wahren Verhältnisses der Naturphilosophie zur verbesserten Fichte'schen Lehre* (Statement of the True Relation of the Nature-philosophy to the Improved Fichtian Doctrine, Tüb. 1806). Meanwhile a most formidable adversary had risen up in his old college-friend Hegel (q.v.), who was at first an ardent disciple of S.'s, as Schelling had been of Fichte, but who had, in a similar manner, broken away, and was now pursuing an independent and professedly antagonistic course of speculation. During the reign of Hegelianism, S. preserved almost unbroken silence. For more than 20 years he published almost nothing, but we know that he was far from being idle. He was observing narrowly the practical as well as the speculative results of the rival system, and maturing his own philosophy for the final phase which it assumed, and which he called, variously, the 'positive,' the 'historical,' and the 'system of Freedom'—the design of which was to interpret, at once philosophically and reverentially, the history, especially the religious history, of mankind. S. admitted that his earlier speculations, though sound in themselves, attained only to 'negative' truth; and to show that the most transcendental metaphy

sician need not be a Pantheist, but might be a believer in a Personal God, or even in a Trinity, with a whole Augsburg Confession beside, he began to apply or develop in a practical way what he conceived to be the principles of his system. It cannot be said that the result has proved satisfactory, though many of his contemporaries thought it would—Neander, e.g., dedicating to him, in eulogistic terms, the first volume of the *Kirchengeschichte*, on the ground that it was in harmony with Schelling's new philosophy. The writings that contain the fruits of Schelling's latest thinking were for the most part posthumously published, though a general idea of them had become known to the public through such lectures as those on the *Philosophy of Mythology* and the *Philosophy of Revelation*. Schelling's *Sämmtliche Werke* (14 vols. Stuttg. 1856-61) were edited by his sons, Karl Friedr. Aug. Schelling and Hermann Schelling. His Correspondence was published at Munich 1863. Various French writers, such as Matter, Rémusat, Cousin, Michelet, have tried (with indifferent success) to explain the great mystic to their countrymen; and English philosophical literature is dubiously associated with his name, through what may be called the somnambular plagiarisms of a kindred genius, Samuel Taylor Coleridge: these were pointed out first by Prof. Ferrier in *Blackwood's Magazine*, 1840, Mar. Consult: Von Hartmann, *Schelling's Philosophisches System* (1897); Watson, *Schelling's Transcontinental Idealism* (1882).

SCHEM, *shĕm*, ALEXANDER JACOB: author: 1826, Mar. 16—1881, May 21; b. Wiedenbrück, Prussia. He was educated at Bonn and Tübingen; came to this country 1851, was professor of languages in Dickinson College 1854-60, was connected with the *New York Tribune* 1860-69, and assistant superintendent of schools in New York 1874-81. He edited the *Deutsch-amerikanisches Conversations-Lexicon* (11 vols.), was on the editorial staff of the *Methodist* and the *Methodist Quarterly Review*, was a contributor to various cyclopedias, and published several valuable statistical works. He died at West Hoboken, N. J.

SCHEMA, in Philosophy, especially the Kantian: a formula or method of a general kind which can be applied in particular instances. The definition or idea of a triangle would illustrate this meaning.

SCHEME, v. *skēm* [L. and Gr. *schēma*, shape, fashion, outline]: to plan; to contrive; to form a plan: N. a connected combination of things contrived toward some end; a plan; a project; a contrivance; a diagram to illustrate; an astrological diagram. SCHEM'ING, imp.: ADJ. given to forming schemes; intriguing; artful: N. the act of one who schemes. SCHEMED, pp. *skēmd*. SCHEM'ER, n. *-ĕr*, one who schemes; a contriver; a planner.—SYN. of 'scheme, n.': plan; design; purpose; system; project; contrivance; outline; device; plot.

SCHEMNITZ, *shĕm'nĭts:* largest and most famous mining town of Hungary, in a narrow mountain gorge, 1,054 ft. above sea-level, on the river S., 70 m. n. of Pesth. The acad. for mining and wooderaft, embracing collections of minerals and a chemical laboratory, is the principal building. It is attended by about 200 students, who receive lessons from six professors. Tobacco-pipe heads of esteemed kind are manufactured here. The mines, which extend under the town, have been worked for centuries, though recently they have yielded inconsiderable profit. They produce gold and silver, as well as copper, iron, and sulphur. One of the passages is more than 9 m. long. 12 mines belong to the crown, the others are private property.— Pop. of S. 16,370, with its six suburbs, 25,000.

SCHENCK, *skĕnk,* NOAH HUNT, D.D.: clergyman of the Prot. Episc. Chh.: 1825,-June 30—1885, Jan. 4; b. Pennington, N. J. He graduated from Princeton College 1844; studied law, and was in active practice 1847–51; studied theology at Gambier (O.) Seminary; and 1853 took orders in the Prot. Episc. Church. After serving parishes in Ohio, Chicago, and Baltimore, he became (1869) rector of St. Ann's Church, Brooklyn, and held this position till his death. He was a delegate of the Evangelical Alliance to Russia 1871. He was founder, and for some time editor, of the *Western Churchman,* and was one of the editors of the *Protestant Churchman.* A volume of his sermons and addresses was published 1885.

SCHENCK, ROBERT CUMMING: 1809, Oct. 4—1890, Mar. 23; b. Franklin, O. He graduated from Miami Univ. 1827, studied law, and began practice 1831 at Dayton, O. He was in the state legislature 1841–2, member of congress 1843–51, and U. S. minister to Brazil 1851–53. He entered the Union army at the opening of the civil war, was commissioned brig.gen. 1861, May 17, and promoted maj.gen. 1862, Sep. 18, and served with credit till 1863, Dec. 3, when he resigned and again entered congress, where by re-elections he remained till 1870. He was then appointed minister to Gt. Britain, but before entering on the duties of this office served on the Alabama Joint High Commission. He resigned 1876 on account of charges relating to his connection with the Emma silver-mine fraud, but was fully exonerated by a congressional committee, and by a judicial inquiry in New York. He resumed his law practice and declined a renomination to congress. He died at Washington.

SCHENE, n. *skēn* [Gr. *schoinos,* a rush or reed, a measure of distance]: an Egyptian measure of length about 7½ miles.

SCHENECTADY, *skē-nĕk'ta-dĭ:* city, cap. of Schenectady co., N. Y.; on the Mohawk river, and on the New York Central and Hudson River and the Delaware and Hudson Canal Co.'s railroads; 17 m. w. of Albany; 6 sq. m. It has an old part with many relics of early Dutch inhabitants and a new part built up closely; is supplied with water from

the river by improved works owned by the city; is lighted chiefly by electricity; and has street railroads. The Erie canal bisects the city. Chief among industries are the manufacture of electrical supplies, agricultural implements, knit and woolen goods, boiler and machine-shop products, locomotives, brooms, and flour. The notable buildings include those of Union University, new city-hall, county court-house, new union railroad depot, 1st Reformed Church, in Dutch Gothic style; St. George's Church (Protestant Episcopal), which has a bell presented by Queen Anne, and St. Andrew's Home of the Friendless. There are several fine churches, and besides Union University, Union Classical Institute (a public high school and academic department of the university), public, parish and private schools, business college, free and other libraries. In 1908 the net public debt was $2,203,888, and the assessed valuation of all taxable property $45,431,706. —Schenectady was an Indian trading-post 1620, was chartered 1684, and made a city 1798. It suffered severely from the early French and Indian wars, and in 1690 was burned, and nearly all its inhabitants were massacred, the bi-centennial of which was commemorated 1890, Feb. 9. Among the early steam railroads in the United States was one from Albany to Schenectady. Pop. (1900) 31,682; (1910) 72,826.

SCHENK-BEER, n. *shĕngk'bēr* [Ger. *schenk-bier*—from *schenken*, to pour out, because put on draught soon after being made]: mild German beer; German draught-beer.

SCHENKEL, *shĕnk'ĕl*, DANIEL, D.D.: theologian: 1813, Dec. 21—1885, May 19; b. Switzerland. He studied theology at Bâle and Göttingen, preached at Schaffhausen, and was professor of theology at Bâle; and 1851 at Heidelberg, where he was also university preacher. His views diverged so much from the ordinary standard as to excite much opposition from the orthodox party. He edited the *Bibel-Lexicon* (5 vols.); founded the German Protestant Union; wrote *Das Wesen des Protestantismus* (3 vols.), *Christliche Dogmatik* (2 vols.), *Das Charakterbild Jesu* (1864), and many other works. He died at Heidelberg.

SCHERBET. See SHERBET.

SCHERIF, n. *shĕ-rēf'* [Ar. *sherif*, lord or master]: title in the East given to the descendants of Mohammed through his son-in-law Ali and daughter Fatima; given also to the chiefs of Mecca and Medina; an emir: in English written often *Sherif* (q.v.).

SCHERZANDO, n. *skĕrts-ân'dō* [It.]: in *mus.*, a lively or droll movement: ADJ. in a playful, lively, or sportive manner.

SCHERZO, *skĕr'tsō* [It., jest, sport]: in *music*, denoting a passage or movement lively and sportive, forming part of a musical composition of some length, as a symphony, quartette, or sonata.

SCHEVENINGEN, *skā'vĕn-ĭng-ĉhĕn:* populous and thriving village in S. Holland, on the coast of the North Sea, about two m. from the Hague. Fishing is the chief industry; ship-building, rope-spinning, and making sailcloth, are carried on. It is the most fashionable sea-bathing resort in the Netherlands, and is visited by many distinguished strangers. There is an excellent 'Bath House,' and other hotels. In the neighborhood are summer residences of the royal family and nobility. A range of sand-hills defends the village from the sea, which has, nevertheless, made so great encroachments that the Prot. church, originally in the centre, is now close by the strand. The road from the Hague to S. is a long avenue of fine trees and wooded banks, with a tramway for passengers and goods.—Pop. about 9,000.

SCHIEDAM, n. *skē-dăm':* Holland gin, named from the town where chiefly it is made.

SCHIEDAM, *skē-dăm':* town in S. Holland, on the Schie, which is connected with the Maas by a canal. The streets are narrow, irregularly built, and, compared with other Dutch towns, dirty, from the distilleries, malting-works, and grain-mills. Gin is so largely manufactured that the air and water smell and taste of it: there are more than 200 distilleries. The neighboring meadows are rich in cattle, fed partly from distillery refuse, of which there is enough to feed about 30,000 pigs. There is extensive manufacture of stearine and glycerine. Beer-brewing, metal-founding, basket-making, cork-cutting, etc., are carried on.—Pop. (1883) 24,196; (1890) 25,260; (1901) 27,069.

SCHIITES, n. plu. *shī'ĭtz:* another spelling of SHIITES (q.v.).

SCHILLER, *shĭl'lĕr,* JOHANN CHRISTOPH FRIEDRICH VON: one of the greatest poetical geniuses of Germany: 1759, Nov. 10 (or 11)—1805, May 9; b. Marbach, a little town of Würtemberg; son of Johann Kaspar S., overseer of the nurseries attached to a country-seat of the Duke of Würtemberg. S. received his first formal instruction from the parish priest Moser, at Lorch; and 1773 the duke, who thought favorably of S. and his father, offered to educate the boy, free of expense, at the milit. acad. founded by him at the castle of Solitude, and afterward transferred to Stuttgart under the name Karls-schule. Entering the rigorous academy, S. applied himself to jurisprudence, with small success; and after two years he exchanged it for medicine. But literature, especially poetry, was the secret delight of his soul. Already the characteristics of his genius —his tendencies toward epic and dramatic idealism—were showing themselves. His first literary attempts of any moment were dramatic—*Der Student von Nassau* and *Cosmus von Medici*—consigned (doubtless with reason) to the fire. Meanwhile the poet's general intellectual culture and his professional studies went steadily on; and 1780 he passed as a milit. surgeon, but with no liking for such a career. In 1778 S. completed the first sketch of his memorable drama *Die Räuber* (The Robbers), whose publication 1780

excited violent enthusiasm among the young all over Germany, so wild, and strong, and glowing were the passion and fancy displayed in it. Respectable people, dignitaries, functionaries, and the like, were scandalized; and the duke himself, a 'Serene Highness' sort of man, was induced to lecture the poet on his delinquency, and forbade him to write any more poetry 'without submitting it to *his* inspection.' In 1782 *The Robbers* was brought upon the stage at Mannheim—the poet being present without the knowledge of his superiors, the result of which was arrest for a fortnight. This led to further complications; and finally, in Oct. of the same year, S. fled from the harsh service of the duke into Franconia, and lived a year under a feigned name at Bauerbach, near Meiningen, where he completed his *Fiesco* and *Cabale und Liebe*, begun at Stuttgart. *Don Carlos* also was sketched in outline here. 1783, Sep., he went back to Mannheim, and was for some time closely connected with actors and theatrical life. To this period belong several of his lesser poems. With the *Cabale und Liebe* above mentioned ended the first poetic period in S.'s career, otherwise known as the *Sturm und Drang* period, in which a burning energy of passion and a robust extravagance, passing often into sheer bombast of speech, are predominant characteristics. 1875, Mar., S. left Mannheim, and proceeded to Leipzig, where he became acquainted, among others, with Huber and Körner, and wrote his beautiful *Lied an die Freude;* thence, after a few months, he went to Dresden, where he began the practice of composing during the night, which so fatally assisted in shortening his life. *Der Geisterseher* (The Ghost-seer), a strikingly powerful romance, was written here; and the drama of *Don Carlos* was completed. In 1787 he was invited to Weimar, and was at once warmly received by Herder and Wieland; but some years elapsed before Goethe and he could understand one another; after that, they became the closest friends. Henceforth, S. owed more to Goethe than to all other men: we may even call the later and best writings of S. inspirations of Goethe. The study of the spirit and literature of antiquity in particular exercised a wholesome influence over him, and in his *Götter Griechenlands* (Gods of Greece), which belongs to this stage, we see how calm, and clear, and sunny his once turbid and stormful imagination was gradually becoming. Reinhold of Jena introduced him to the Kantian philosophy, and for a little time S. was in danger of lapsing from a poet into a metaphysician. The philosophical and æsthetic treatises springing out of this new study were collected and published under the title *Kleine prosaische Schriften* (4 vols. Jena 1792–1802). His *Geschichte des Dreissigjährigen Kriegs* (History of the Thirty Years' War) originally appeared in the *Taschenkalender für Damen* (1790–93). On the occasion of the poet's marriage 1790 with Charlotte von Lengefeld, the Duke of Meiningen made him a *Hofrath* (privy councilor); the French republic conferred on him the right of citizenship; and 1802 the emperor raised him to the rank of nobility. While staying for a year with his relatives in

Würtemberg, he wrote his exquisite *Briefe über ästhetische Erziehung* (Letters on Æsthetic Culture). This period, reaching to the close of 1794, is generally regarded as Schiller's *transition* period; in poetic accomplishment it is not rich; but in earnest, thoughtful, and manifold speculation it was highly important to the poet, and we find that it prepared the way for the last and most splendid development of his genius. After 1795 the finest of his lyrics and dramas were produced—as *Der Spaziergang* and the *Lied der Glocke* (Song of the Bell) 1796, *Wallenstein* (1799), *Maria Stuart* (1800), *Die Jungfrau von Orléans* (1801), *Braut von Messina* (Bride of Messina, 1803), and finally his greatest drama, *Wilhelm Tell* (1804). But his health had been long giving way, partly owing to a natural weakness of constitution, and partly to incessant application to study; and he died at the early age of 46. Ever since his death his fame has been on the increase; he has long been recognized as, next to Goethe, the greatest poet that Germany has produced, and innumerable editions of his works have been published. See *The Life of Friedrich Schiller* by Carlyle (1825). There are numerous German biographies, the latest by Richard Welbrick, begun in 1885. Others are by Otto Brahm, Jacob Minor, and Diantzer.

SCHILLER-SPAR, n. *shĭl'lėr-spâr* [Ger. *schiller-spath,* schiller-spar; *schillern,* to exhibit a play of color]: a mineral, being a hydrated silicate of magnesia, of a grayish-green or yellowish-brown color.

SCHILLING, *shĭl'lĭng,* JOHANNES: sculptor: b. Saxony, 1828, June 23. His first work to attract attention was a fine group, *Amor and Psyche,* exhibited 1851. The excellence of his work in Berlin secured him a scholarship for two years in Italy. He then settled at Dresden, and 1868 was appointed professor in the academy. Among his great works are the Luther monument at Worms; *Four Seasons;* the statue of Schiller at Vienna; the war memorial at Hamburg; and the National Monument, which was unveiled by Emperor William 1883.

SCHINDYLESIS, n. *shĭn'dĭl-ē'sĭs* [Gr. *schindŭlēsis,* a cleaving into small pieces—from *schizō,* I cleave]: that form of articulation in which a thin plate of bone is received into a cleft or fissure formed by the separation of two laminæ of another bone.

SCHINKEL, *shĭnk'ėl,* KARL FRIEDRICH: German architect and painter: 1781, Mar. 13—1841, Oct. 9; b. Neuruppin, in Brandenburg. He studied at Berlin, and (1803) in Italy. In 1820 he became professor at the Berlin Academy of Arts. Other offices and honors were conferred on him. The designs to which chiefly he owes his reputation are those of the Royal Guard-house, the Memorial of the War of Liberation, the New Theatre, the New Potsdam Gate, the Artillery and Engineers' School in Berlin, the Casinos in and near Potsdam, and a great number of castles, country-houses, churches, etc.

SCHINUS, *skī'nŭs:* genus of trees and shrubs of nat. order *Anacardiaceæ*, natives of S. America. The leaves so abound in a resinous or turpentine-like fluid, that on the least swelling of the other portions of the leaf, by moisture, it is discharged from the sacs which contain it. Thus they fill the air with fragrance after rain; or if thrown into water, start and jump about as if alive, discharging jets of this peculiar fluid. The same phenomenon is exhibited by the leaves of some species of the kindred genus *Duvaua*, of which specimens are seen in greenhouses. The leaves and twigs when bruised have strong odor of turpentine.

SCHIRRHOUS, SCHIRRHUS: see SCIRRHUS.

SCHISM, n. *sizm* [F. *schisme*—from L. and Gr. *schisma*, a division, a separation—from Gr. *schizō*, I split, I rend] a division or separation in a church, or among the same sect or religious body. SCHISMATIC, a. *sĭz-măt'ĭk*, or SCHISMAT'ICAL, a. *-ĭ-kăl*, pertaining to or tending to a schism. SCHISMAT'IC, n. one who separates, owing to a difference of opinion, from a religious body, especially from an established church. SCHISMAT'ICALLY, ad. *-lĭ*. SCHISMAT'ICALNESS, n. *-nĕs*, the state of being schismatical. SCHISMATIZE v. *sĭz'mă-tīz*, to take part in a schism. SCHIS'MATIZING, imp. SCHIS'MATIZED, pp. *-tīzd:* see *note* under DISSENT. —SYN. of 'schism': dissent; heresy; heterodoxy.

SCHISM, GREEK: the separation between the Greek and Latin churches, which originated in the 9th, and was completed in the 11th c.: see GREEK CHURCH: FILIOQUE.

SCHISM, WESTERN: notable disruption of communion in the Western Church, which arose out of a disputed claim to succession to the papal throne, and lasted nearly 40 years, 1378–1417. On the death of Gregory XI., 1378, a Neapolitan, Bartolomeo Prignano, was chosen pope by the majority of the cardinals in a conclave at Rome, under the name Urban VI. Soon afterward, however, a number of these cardinals withdrew and revoked the election, declaring it to have been not free, because of the violence of the factions in Rome which had overawed the conclave; and, in consequence, they proceeded to choose another pope, under the name Clement VII., who fixed his see at Avignon, while Urban VI. lived at Rome. A rival succession was maintained till the Council of Pisa 1410, in which assembly both were deposed, and a third pope, John XXIII., was elected. This measure not having been acquiesced in by all, a new council was convened at Constance 1417, in which not only the former rivals, but even the new pontiff elected, by consent of the two parties, at Pisa, were set aside, and Otho Colonna was elected, under the name Martin V. In this election the whole body may be said to have acquiesced; but one of the claimants, Peter de Luna, called Benedict XIII., remained obstinate in the assertion of his right till his death 1430.

SCHISMA, *skĭz'mâ:* one of the very small intervals known in the theory of music, which amounts to the difference between the *Comma ditonicum* and *Comma syntonicum*: see COMMA.

SCHIST, n. *shĭst* [Gr. *schistos*, divisible—from *schizō*, I plit: F. *schiste*]: term applied loosely to any varieties of plate or slate-rock which may easily be split; it denotes properly such rocks as mica-schist, gneiss, and the like, of metamorphic strata composed of plates of differing minerals, whose foliated structure splits into thin irregular plates, and not by regular cleavage as do the clay-slate or flagstones. SCHISTIC, a. *shĭs'tĭk*, or SCHISTOSE, a. *shĭs-tōs'*, slaty; having a slaty structure—applied to crystalline, or metamorphic rocks.

SCHIZOCARP, n. *skĭz'ō-kârp* [Gr. *schizō*, I cleave; *karpos*, fruit]: in *bot.*, a dry seed-vessel, splitting into two or more one-seeded mericarps.

SCHIZOMYCETES, *skĭz-ō-mī-sē'tēz*, otherwise termed SCHIZOPHYTES or PROTOPHYTES [Gr. *schizō*, I cut; *mukēs*, fungus—referring to propagation by self-division]: the lowest division of the vegetable kingdom, characterized by asexual reproduction. As these plants have little in common with fungi proper, the second and third names above given are preferable, the last being more in favor, while the first two refer to a mode of propagation not confined to Protophytes. They are allied to the lowest algæ (*Schizophyceæ*) and are mostly microscopic, inhabiting all situations, and including the slime-molds, green slimes (e.g., Nostoc, Oscillaria), and the Bacteria and Yeast-plant, to which last two some authors confine the term Schizomycetes. See BACTERIA: BACILLUS.

SCHIZOPH'YTÆ—SCHIZ'OPHYTE: see SCHIZOMYCETES.

SCHIZOPOD, n. *skĭz'ō-pŏd* [Gr. *schizō*, I split; *pous* or *poda*, a foot]: a crustacean whose legs have each an accessory jointed branch so as to appear double.

SCHLAGINTWEIT-SAKÜNLÜNSKI, *shlâ'ghĭn-twīt-sâ kün-lün'skē*, HERMANN VON: traveller: 1826, May 13—1882, Jan. 19; b. Munich. In connection with two of his brothers, ADOLF S. (1829, Jan. 9—1857, Aug. 26) and ROBERT S. (1833, Oct. 27—1885, June 6), he travelled extensively and conducted various scientific investigations. The two elder brothers explored the Alps and published (1850) *Untersuchungen über die physikalische Geographie der Alpen*, after which the three made an Alpine exploration and published *Neue Untersuchungen* (1854). During the next four years, under the auspices of the Brit. E. India Company and the king of Prussia, they explored the Himalaya Mountains, Thibet, Hindustan, and Deccan. Their experiences and discoveries are described in *Results of a Scientific Mission to India and High Asia* (5 vols.). Hermann wrote also *Reisen in Indien und Hochasien* (4 vols.) Robert became prof. of geography at Giessen 1864, but spent considerable time in travelling, principally in the United States. He published *Die Pacific Eisenbahn in Nordamerika* (1870), and *Californien, Land und Leute* (1871). Hermann died at Munich, Adolf was killed at Kashgar, and Robert died at Giessen.

SCHLANGENBAD, *shlâng'ên-bât:* small village and notable spa, in Germany, on the n. frontier of the Rheingau dist., 6 m. w. of Wiesbaden, and about 4½ m. s. of Schwalbach (q.v.); in a beautiful and secluded situation, embosomed in wooded hills. The water of the baths has a temperature of 80° F., and contains the muriates and carbonates of lime, soda, and magnesia, with slight excess of carbonic acid. The baths are resorted to for affections of the skin, and for soothing effect in nervous disorders.

SCHLATTER, *shlât'têr,* MICHAEL: clergyman: 1716, July 14—1790, Nov.; b. Switzerland. He studied at the Univ. of Helmstedt, Brunswick: and after teaching in Holland, and preaching for a short time in Switzerland, he came to this country as a missionary to destitute German Reformed congregations. He was settled 1747, Jan. 1, as pastor of the Philadelphia and Germantown Reformed churches, organized a synod, and preached and organized churches in other parts of Penn. and in neighboring states. He went to Europe 1751, and returned the following year with six assistants and a large sum of money for his work; made an unsuccessful attempt to establish schools in which the English language should be taught, was chaplain of the Nova Scotia expedition 1757, sympathized with the colonists in the revolution, and 1777 was imprisoned by the British.

SCHLEGEL, *shlā'ghêl,* AUGUST WILHELM VON: German critic, poet, and translator: 1767, Sep. 8—1845, May 12; b Hanover. He studied at Göttingen, where he acquired reputation by ardor in philological and classical studies. He began to assume a prominent position in literature, while a lecturer at Jena, contributing assiduously to Schiller's *Horen* and *Musen-Almanach,* and to the *Allgemeine Literaturzeitung.* About the same time, his translation of Shakespeare began to appear (9 vols. Berl. 1797—1810), whose influence on German poetry and the German stage was equally great. Subsequently, the poet Tieck, with S.'s consent, undertook a revision of the work, with translation of such pieces as S. had omitted (12 vols. Berl. 1825, 39, 43); and from their joint labors, the people of Germany are able to form a faithful idea of the surpassing genius of Shakespeare. S. with his brother, Friedrich, edited the *Athenæum* (3 vols. Berl. 1796–1800), which in spite of, perhaps because of, the severity of its criticism, gave a lively and wholesome impulse to the poetry of its time. He published, besides, his first vol. of poems (*Gedichte,* Tüb. 1800); and, again in company with his brother, the *Charakteristiken und Kritiken* (2 vols. Königsb. 1801). In 1802 S. left Jena for Berlin. In 1803 appeared his *Ion,* an antique tragedy. His *Span. Theater* (2 vols. Berlin 1803–09), consisting of five pieces of Calderon's, admirably translated, has made that poet a favorite with the German people; and his *Blumensträusse der Ital., Span., und Portug. Poesie* (Berl. 1804), naturalized in German verse the metrical forms of the Romanic races. Probably his most valuable, certainly his most popular work,

was his *Vorlesungen über dramatische Kunst und Literatur* (3 vols. Heidelb. 1809–11), originally delivered at Vienna 1808, transl. into most European languages. 1811–15, S. published a new collection of his poems (*Poetische Werke*), which contains his masterpieces, 'Arion,' 'Pygmalion,' 'St. Lucas,' rich and various in poetic forms, and with singular facility of versification. In 1818, S., now raised into the ranks of the nobility, was appointed prof. of history in the Univ. of Bonn, and applied himself to the history of the fine arts and to philological research. He was one of the first students of Sanskrit in Germany, and established a Sanskrit printing-office at Bonn. His scholarly activity in this department was shown by his ed. of the *Bhagavad Gîta*, an episode from the epic poem *Mahâbhârata*, with Latin transl. (2d ed. Bonn 1846), and of part of the *Râmâyana* (Bonn 1829–39). S. was not happy in his domestic relations. He was twice married, first to a daughter of Prof. Michaelis of Göttingen, then to a daughter of Prof. Paulus of Heidelberg; but in both cases a separation soon became necessary. S. was jealous, and ungenerous in his relations with literary men, and when excited did not even shrink from slander.

SCHLE'GEL, Karl Wilhelm Friedrich von: historian of literature: 1772, Mar. 10—1829, Jan. 11; b. Hanover; bro. of August Wilhelm von S. He studied at Göttingen and Leipzig, and 1797 published his first work, *Griechen und Römer* (The Greeks and Romans); followed in the course of a year by *Geschichte der Poesie der Griechen und Römer* (History of Greek and Roman Poetry), fragmentary continuation of the former. Both showed rich learning, independent thought, and appreciation of the principles and method of historic criticism; but the chief vehicle at this time for dissemination of his philosophical views of literature was the sharp-fanged periodical *Athenæum*, edited by himself and his bro. August Wilhelm. Proceeding to Jena, he started there as *privat-docent*, holding lectures on philosophy, with great applause, still editing the *Athenæum*, contributing poems in most diverse meters. In 1802 appeared *Alarkos*, tragedy, in which the antique-classical and new-romantic elements are singularly blended. He soon went to Dresden, and thence to Paris, where he gave a few more of those philosophical prelections, in the manufacture of which both he and August Wilhelm were unhappily too expert; edited the *Europa*, monthly journal (2 vols. Frankf. 1803–05); and applied himself assiduously to the languages of s. Europe, and still more assiduously to Sanskrit, as is seen in his treatise, *Ueber die Sprache und Weisheit der Indier* (Heidelb. 1808): see Philology. During his residence in Paris, he published a *Sammlung Romantischer Dichtungen des Mittelalters* (Collection of Mediæval Romantic Poems, 2 vols. Par. 1804), and the pious chivalric romance of *Lother und Maller* (Berl. 1805). On his return to Germany, he published a vol. of dithyrambic and elegiac poems (*Gedichte*, Berl. 1809). At Cologne, he passed over to the Rom. Cath. Church, a change to which his mediæval studies

powerfully contributed, and which affected his future literary career. In 1808, S. went to Vienna, where, 1811, appeared his *Ueber die neuere Geschichte* (Lectures on Modern History), and 1815, his *Geschichte der alten und neuen Literatur* (History of Ancient and Modern Literature). In 1822 a collected ed. of his writings, 12 vols. (*Sämmtliche Werke*), was pub. by himself. Subsequently, he delivered two series of lectures, on the Philosophy of Life (*Philosophie des Lebens*, Vienna 1828), and on the Philosophy of History (*Philosophie der Geschichte*, Vienna 1829), both well known in other countries through translations.

SCHLEICHER, *shlī'chĕr*, AUGUST: philologist: 1821, Feb. 19—1868, Dec. 6; b. Meiningen, Germany. After studying theology and comparative philology at Leipzig and Tübingen, he graduated from Bonn 1846. Four years later he accepted a professorship at Prague, and 1857 one at Jena. He was remarkably proficient in the Slavo-Lettic languages. He published *Die Sprachen Europas; Compendium der vergleichenden Grammatik der Indogermanischen Sprachen*, which passed through three editions and was translated into English; and other works. He died at Jena.

SCHLEIERMACHER, *shlī'ĕr-mä'chĕr*, FRIEDRICH DANIEL ERNST: 1768, Nov. 21—1834, Feb. 12; b. Breslau; son of a chaplain (of the Reformed Church) in the Prussian army: one of the greatest and most influential theologians of modern times. His boyish years were spent in the school kept by the Moravian brotherhood at Niesky, and here first he received those religious impressions which influenced his after-life. In 1787 he proceeded to the Univ. of Halle; and after his academic course, was for some time a teacher; but 1794 became assistant-clergyman at Landsberg-on-the-Warthe, where he remained for two years. He then went to Berlin, and occupied himself partly in translation of some of Blair's and Fawcett's Sermons, and in redaction of the *Athenæum*, conducted by his friend Friedrich Schlegel; but his work that first won celebrity was *Reden über die Religion* (Discourses on Religion, Berl. 1799), which startled Germany from its spiritual torpor, vindicated the eternal necessity of religion, and sought to separate those elements of it that are essentially divine from the incrustations of dogma and the formalities of practice. Neander considered these *Reden* as making the turning-point in his own spiritual career; and they are now regarded as both making and marking an epoch in the theological history of Germany. The *Reden* were followed by the *Monologen*, and the *Briefe eines Predigers ausserhalb Berlin* in 1800. Two years later he was appointed preacher at the Charity-house in the Prussian capital; and during 1804-10 produced his famous transl. of Plato, with commentary, considered in Germany to this day the most profound and penetrating treatise on the Platonic philosophy, though English scholars incline to regard its criticism as too subjective, and in important re-

spects baseless. In 1801 appeared the first collection of his *Predigten* (Sermons), followed 1808-33 by six other collections. They are masterpieces of penetrating and eloquent discussion, appealing equally to the heart and the intellect of hearers and readers. In 1802 S. went as court-preacher to Stolpe, where he published *Grundlinien einer Kritik der bisherigen Sittenlehre;* and 1804 was called to Halle as univ.-preacher and prof. of theol. and philos. In 1807 he returned to Berlin. Among his next publications are *Ueber den sogenannten ersten Brief des Paulus an den Timotheus* (Concerning the So-called First Epistle of Paul to Timothy, Berl. 1807). In 1809 he became pastor of Trinity Church, Berlin; and 1810, when the Univ. of Berlin was reopened, with a brilliant array of professors, under the rectorship of Fichte, no name was more conspicuous than his. In 1811 he was chosen a member of the Berlin Acad. of Sciences, in whose Transactions are valuable papers by S. on the ancient philosophy; and 1814 sec. of the philosophical section. In 1817 he was appointed pres of the synod assembled in Berlin. His latest and perhaps his most important work is *Der Christliche Glaube nach den Grundsätzen der Evang. Kirche im Zusammenhange dargestellt* (The Christian Faith Systematically presented according to the Fundamental Propositions of the Evangelical Church, 2 vols. Berl. 1821-2), in which his deepest and most Christian thought is visible. He died at Berlin. The list of S.'s disciples—i.e., of men who have derived the groundwork of their principles from him—is one of the most splendid that any theological reformer could show, comprising, with many others, Neander, Nitzsch, Twesten, Olshausen, Lucke, Bleek, Ullmann. In 1864 appeared a posthumous work of S., *Das Leben Jesu, Vorlesungen an der Universität zu Berlin im Jahr* 1832, in which he conceives of the Lord Jesus as a man in whom the Spirit of God works as perfectly as is possible in humanity, and treats his history accordingly. Strauss has replied in a critique (Berl. and Lond. 1865). S.'s theology on several points does not square itself with the traditional 'orthodoxy' of Britain and the United States; but he was a great, earnest, devout, spiritual, evangelical Christian man, of massive understanding, and whose eloquence was scarcely less golden than that of Plato himself. Germany overflows with literature on S., his system and his ideas.—Among the more important works on S. are Dilthey's *Leben S.'s* (I. 1870); *Aus Schleiermacher's Leben in Briefen* (1858, Eng. transl. 1860); Bender, *S.'s Theologie* (1878); Lang, *Religiöse Charactere* (1862).

SCHLESWIG, *shlès'vich:* duchy, formerly part of Denmark: see SLESVIG: DENMARK: SCHLESWIG-HOLSTEIN

SCHLES'WIG (Dan. SLESVIG): city, cap. of the Prussian province of Schleswig-Holstein; on the w. end of the Schlei, a long, narrow arm of the sea; lat. 54° 31′ 11″ n., long. 9° 34′ 45″ e. It consists mainly of a single street of semicircular form and 3½ m. long, around the head of the Schlei. It is of little commercial importance, the Schlei being unnavigable except for vessels of light draught; it has few manufactures. The principal church, built about 1100, renewed in the 15th c., has a fine carved altar-screen. S. was as early as the 9th c. a great mart for exchange of goods between the countries of the North Sea and those of the Baltic. About the middle of the 10th c. it became a bishop's see and the residence of the dukes of SLESVIG (q.v.).—Pop. 17,900.

SCHLES'WIG-HOLSTEIN, *-hōl'stīn:* Prussian prov., bounded n. by Denmark, w. by the North Sea, s. by the Elbe and Mecklenburg, e. by Mecklenburg, Lübeck, and the Baltic; 7,280 sq. m. For the history of the two duchies comprised in S.-H., see SLESVIG: DENMARK: GERMANY—*North German Confederation:* HOLSTEIN. On the Baltic side the coast consists of a continuous range of wooded hills, presenting the most productive soil in the province. The central plain has thin, sandy soil. Along the w. coast is a belt of rich alluvium 5–15 m. wide, only a few ft. above sea-level, and in many places even below it: there the sea is kept out by dikes. The Baltic coast is diversified and indented by numerous fiords which afford safe harbors: the North Sea coast-line is broken only by the estuary of the Eider and the Eiderstedt peninsula. The climate on the whole is healthful, and the mean annual temperature(45° F.—49° F.) higher than in inland countries of the same latitudes. The agricultural products are: cereals, of which there is considerable surplus exported; rape and flax; apples and other fruits, largely for export. The stock raising and dairying industries, and the fisheries are important sources of food supply and avenues of wealth. The mineral resources are inconsiderable, as is also the manufacturing industry; ship-building at Kiel has attained high importance. Other industries include sugar factories, breweries and distilleries and besides Kiel, the principal ports are Altona, Helgoland, Flensburg, Neumühlen, Sonderburg, Wyck, Tonning, and the capital Schleswig. S.-H. has 10 representatives in the Reichstag, and 19 in the Prussian Abgeordnetenhaus or chamber of deputies. Pop. 1,387,800.

SCHLETTSTADT, *shlĕt'stât* (French *Schlestadt*): town of Lower Alsace, on the left bank of the Ill, 26 m. s.w. of Strasburg. Till the war of 1870–1, S. was a French fortress of the third class. It was bombarded and compelled to capitulate to the Germans 1870, Oct. 24. The fortifications have been demolished.—Pop. 9,300.

SCHLEY, *shlī*, WINFIELD SCOTT: naval officer: b. Frederick co., Md., 1839, Oct. 9. He graduated from the U. S. Naval Acad. 1860, was in many engagements in the civil war, was instructor at the acad. 1866–69, and after serving on the Asiatic station returned to the acad. He was connected with the Brazil station 1876–79, and 1884 was in command of the expedition which brought Lieut. Greely and six others from Grinnell Land. He was promoted commander 1874, became chief of the navy equipment and recruiting bureau 1885, and capt. 1888. With J. R. Soley he published *The Rescue of Greely* (1886). In 1898 he was promoted commodore and put in command of the Flying Squadron on duty in Cuban waters; blockaded Cervera's fleet in Santiago harbor, and his squadron united with that of Adm. Sampson—was in immediate command at the destruction of that fleet July 3. He was promoted rear-admiral 1898, Aug., and retired 1901, Oct. 9. A controversy having arisen between his friends and those of Admiral Sampson as to whom the credit of the victory belonged, and his bravery having been impugned, he requested an inquiry into his conduct. The majority report found him guilty of vacillation, lack of enterprise and disobedience, but Admiral Dewey, one of the court, upheld him. In 1902, Jan., he appealed from the verdict to President Roosevelt, but the latter confirmed the approval of the Secretary of the Navy, and censured Admiral Schley.

SCHLIEMANN, *shlē'mân*, HEINRICH: Hellenic archeologist and explorer: 1822, Jan. 6—1890, Dec. 27; b. Neu-Buckow, Mecklenburg-Schwerin. He attended the Realschule of Neu-Strelitz 1834–36, and then was apprenticed to a retail grocer in Fürstenberg, in whose service he remained five years, when he was by an accident disabled for physical labor. He then went to Hamburg and took ship to St. Petersburg 1846 as representative of the firm of Schroeder & Co., of Amsterdam. In St. Petersburg he embarked also in business on his own account. Meanwhile he added modern and ancient Greek to his linguistic acquisitions. He had accumulated $20,000 by 1849, and then went to California, taking about half his capital. At Sacramento he bought gold of the miners, and sent it to San Francisco for sale; later he opened a bank. By the admission of California as a state of the Union, S. became a citizen of the United States. He returned to St. Petersburg 1853 with his capital more than doubled. He made the circuit of the globe 1864-66; visited the sites of ancient Greek towns.

Having obtained a permit from the sultan, he began excavations on Mt. Hissarlik in the Troad 1870: see TROY He unearthed the acropolis of ancient Mycenæ (q.v.) 1876 discovering the royal sepulchres believed in the time of Pausanias to contain the remains of Agamemnon and his companions, slain by Ægisthus and Clytemnestra: the objects found in these tombs were crowns, necklaces, rings, etc., of pure gold, weighing 100 lbs. or more. He uncovered the 'treasury' of Orchomenus (q.v.), and en-

riched science by the discovery of a highly artistic sculptured ceiling dating from prehistoric times. At the site of Tiryns (q.v.), he discovered the great prehistoric palace of the kings of Tiryns, 1884–5. His published works, all (or nearly all) of which have been translated into English, are: *La Chine et Le Japon* (1866); *Ithaka, der Peloponnes und Troja* (1869); *Trojanische Alterthümer* (1874); *Mykenä* (1878); *Ilios* (1881); *Orchomenos* (1881); *Reise in der Troas* (1881); *Troja* (1883); *Tiryns* (1886). S. had a charming residence at Athens from 1871 to his death.

SCHLOSSER, *shlös'ĕr*, FRIEDRICH CHRISTOPH: German historian: 1776, Nov. 17—1861, Sep. 23; b. Jever. He was educated at Göttingen; was long a private tutor and academic teacher, and 1817 was called to Heidelberg as prof. of history. His principal writings (in the order of time) are: *Abälard und Dulcin* (Gotha 1807); *Leben Beza's und des Peter Martyr Vermili* (Heidelb. 1809); *Geschichte der Bilderstürmenden Kaiser des Oeström. Reichs* (Frankf. 1812); *Weltgeschichte in Zusammenhängender Erzählung* (Frankf. 1817–24); *Geschichte des* 18. *Jahrh.* (Heidelb. 1823); *Universalhistorische Uebersicht der Geschichte der Alten Welt und ihrer Cultur* (Frankf. 1826–34); *Weltgeschichte für das Deutsche Volk* (1844–53); and *Studien über Dante* (1856). Of these works, most notable are *Geschichte des* 18. *Jahrh.*, continued by S. in the later editions till the fall of Napoleon; and *Weltgeschichte für das Deutsche Volk;* both transl. into English and other tongues. A keen, critical, and powerful writer, S. judges men and events by a stern ethical standard. See Life by Weber (1876).

SCHMALKALD, *shmâl'kâlt*, LEAGUE OF: defensive alliance concluded provisionally for nine years at Schmalkalden (q.v.), 1531, Feb. 27, between nine Prot. princes and eleven imperial cities, with which other five princes and ten imperial cities subsequently made common cause: the Elector of Saxony and the Landgrave of Hesse being appointed chiefs of the league, empowered to manage its affairs. The object of this formidable alliance, which included the whole of n. Germany, Denmark, Saxony, and Würtemberg, and portions of Bavaria and Switzerland, was the common defense of the religion and political freedom of the Protestants against Emperor Charles V. and the Rom. Cath. states. The league was not rendered superfluous by the religious peace of Nürnberg 1532; and on the rumor that the emperor was meditating new hostile measures against the Protestants, another meeting of the confederates 1535, Dec. 24, resolved to raise a permanent army of 10,000 foot and 2,000 cavalry, and to prolong the league ten years. The confederation was further consolidated by articles of guarantee drawn up by Luther at Wittenberg 1536, and being subscribed by the theologians present at the meeting of the league at Schmalkalden 1537, Feb., were called *Articles of Schmalkald.* Against the league, the emperor, engaged in contests with the Turks and French, found himself unable to contend, though supported by the Holy League, a Rom.

Cath. confederation formed 1538, in opposition to the Prot. one. But impolitic management, mutual jealousies, and conflicting petty interests, dissipated the Prot. energies, and prevented united action. The 'War of Schmalkald, commenced by the advance of the army of the league under Sebastian Schärtlin into Swabia, to bar the approach of the imperial army from Italy. Schärtlin forced his way to the banks of the Danube, but the miserable jealousy of the Saxon princes paralyzed his action. The emperor, by proclamation 1546, July 20, put the two chiefs of the league under the ban of the empire; Maurice, Duke of Saxony, took possession of the electorate, by virtue of an imperial decree; and the Prot. army was forced to retreat. The Elector of Saxony reconquered his electorate in the autumn of 1546, but meantime the imperial army subdued the northern members of the League of S., and advanced into Franconia to meet the combined armies of Saxony and Hesse, which were totally routed at Mühlberg (1547, April 24), and both chiefs fell into the emperor's hands. This defeat, ascribed to treason, finished the war. The object of the league, the guarantee of the liberty of religion to the Protestants, was subsequently effected by Maurice, now Elector of Saxony, who, by a brilliant feat of diplomacy and generalship, compelled the emperor to grant the treaty of Passau (1552, July 31), by which this freedom was secured.

SCHMALKALDEN, *shmâl'kál-dĕn:* old and interesting town of Hessen-Nassau, Prussia, at confluence of the Stille and Schmalkald, 11 m. n. of Meiningen. It is surrounded with double walls, contains two castles, and carries on considerable mining operations, especially in iron, and various manufactures, the chief of which are hardwares. Pop. 8,725.

SCHMIDT, *shmĭt,* HENRY IMMANUEL, D.D.: 1806, Dec. 21—1889, Feb. 11; b. Nazareth, Penn. He graduated from the Moravian Theol. Seminary at Nazareth; taught for three years; became a Lutheran clergyman, and 1831 was settled in Bergen co., N. J. He was afterward pastor at Boston; prof. for a year in the Luth. College at Gettysburg, Penn., and 1839–43 in the theol. seminary at that place; preached at Palatine, N. J., two years, and was principal of the Luth. Seminary at Hartwick, N. Y., 1845–48. In the latter year he became prof. of German language and literature in Columbia College. He held this position till 1880, when ill health caused his resignation, and he became prof. emeritus. He wrote many theological articles and several books. Among the latter were a *History of Education* (1842), and a *Course of Ancient Geography* (1860).

SCHMITZ, *shmĭts,* LEONHARD, PH.D., LL.D.: author and educator: 1807, Mar. 6—1890, May 28; b. Germany. He studied at Bonn 1828–32, giving special attention to history and philology, taught in the gymnasium of Bonn, and 1836 removed to England. He gave several years to authorship, was rector of the Edinburgh High School 1845–66, and in the latter year became principal of the London

International College, which position he held till 1874, when he became classical examiner in the Univ. of London. He was tutor to the Prince of Wales and Prince Alfred, edited various works, contributed to cyclopedias, and published numerous educational works, including Latin, Greek, and German grammars; a *History of Latin Literature;* and a *Manual of Ancient History*, which passed through 13 editions. For his 'services to classical education and literature' the British govt. granted him a pension 1881.

SCHMUCKER, *shmŭk'ĕr*, SAMUEL SIMON, D.D.: 1799, Feb. 28—1873, July 26; b. Hagerstown, Md.: son of the Rev. J. G. S., D.D. He graduated from the Univ. of Pennsylvania 1817, and from the theol. seminary at Princeton 1820; was settled at New Market, Va., 1820–26; was prof. in the Evangelical Luth. Theol. Seminary at Gettysburg, of which he was one of the founders, and chairman of its faculty 1826–64; was prominent in the organization of the Luth. general synod; and by his writings prepared the way for the formation of the Evangelical Alliance, to whose first meeting, London 1846, he was a delegate. More than 400 men were fitted for the ministry under his care; he draughted the formula for the govt. of the Evangelical Lutheran Church, and published about 100 sermons, addresses, and books. Among the latter were: *Elements of Popular Theology*, of which 9 editions were sold; *Psychology, or Elements of a New System of Mental Philosophy* (1842); *Lutheran Manual* (1855); and *The True Unity of Christ's Church* (1870). He died at Gettysburg, Penn.

SCHNAPPS, or SCHNAPS, n. *shnăps* [Ger. *schnapps*, a dram]: dram of Holland gin or other ardent spirits.

SCHNEEBERG, *shnā'bĕrch:* pleasantly-built and important mining town of Saxony, surrounded by mountains, 20 m. s.w. of Chemnitz. The principal products of the mines are silver (though not in its former great abundance), cobalt, bismuth and nickel, iron, etc. Cloth, shoes, and cigars are manufactured. Pop. (1880) 7,642; (1890) 8,213.

SCHNEEKOPPE, *shnā'kop-pā:* culminating point of the mountain chain of the Riesengebirge: see BOHEMIA.

SCHNEIDER, *shnī'dĕr*, HORTENSE CATHERINE: actress: b. Bordeaux, France, about 1835. Against the wishes of her parents, she appeared, when 15 years of age, at a theatre in Bordeaux. She studied singing, played minor parts at Agen for three years, and then appeared at the Théâtre des Bouffes in Paris. She afterward played at other theatres in Paris, became one of the most famous actresses of the time, and secured an immense fortune. Her greatest success was in *La Grande Duchesse de Gérolstein* at Paris 1867, and London 1868. She married 1881 an Italian count, and retired from the stage, but soon separated from her husband, and has since lived just outside of Paris.

SCHNEI'DER, JOHANN GOTTLOB: philologist: 1750, Jan. 18—1822, Jan. 12; b. Saxony. He studied at Leipzig and Göttingen, assisted Brunck in preparing an edition of the Greek poets, was prof. of anc. languages in the Frankfort Univ. 1776–1811, and held the same position from the removal of the institution to Breslau in the latter year till 1816, when he resigned to become its librarian. He published valuable editions of several classical works, including *Xenophontis Opera* (6 vols.), and *Theophrasti Opera* (5 vols.); and a *Griechisch-Deutsches Wörterbuch* (2 vols.), which passed through three editions, to the last of which he added a supplement.

SCHNIT'ZER, EDWARD: see EMIN PACHA.

SCHNORR VON KAROLSFELD, *shnor fŏn kä'rōlss-fĕlt*, JULIUS: German painter: 1794–1872; b. Leipzig; bro. of Louis S. von K., noted artist. After a year of study at Vienna, he with others revolted from the dominant Acad. methods and style. Among his first noted pictures were *Wrestling of Christian Cavaliers with Pagans, from Ariosto*, and *St. Roch Distributing Alms*. From 1817, he spent a year in Florence, and six years in Rome, painting in fresco the villa Massimi, and producing many Scripture subjects on canvas. Called 1827 to the chair of hist. painting in the Munich Acad., he executed illustrations of the Nibelungen in 5 great halls of the new palace, and many similar works, such as a frieze of subjects from Homer. In 1846 he became director of the Acad. gallery, and prof. at Dresden. There he finished his *Bible in Pictures*, 240 plates, with preface and text (Leipzig 1852–60); also painted *Luther at the Diet of Worms*, and designs for windows of St. Paul's, London, e.g., *St. Paul on the Damascus Road*. It is said that he alone of the Munich fresco-painters combined happily the ideal and the real.

SCHOEFFER, *shŏf'fĕr* (or SCHOIFFER), PETER: printer: about 1430–1503; b. Gernsheim, Germany. After serving as a copyist at Paris, he secured, when about 20 years of age, employment at Mentz, in the printing establishment of Gutenberg and Faust. He made various important improvements in the details of printing, and soon after his employers separated, 1455, he entered into partnership with Faust, whose daughter he afterward married. The books printed by the firm were noted for excellence of type and press-work. After the death of Faust, S. conducted the business alone. A monument in his honor was erected 1836 in his native town. His son, Johann S., succeeded him in the printing business.

SCHOELCHER, *shāl-shār'*, VICTOR: French publicist: 1804, July 21—1893, Dec. 26; b. Paris. He was educated in the Coll. of Louis the Grand, inherited a fortune, and gave himself to fine-art criticism until 1822; when, with a passion for liberty and justice, he joined liberal societies to bring about the downfall of the govt. of Charles X. Visiting America and the Antilles 1829, he was profoundly indignant at the condition of the slaves, and began his long work to effect emancipation in the French colonies and

elsewhere. Returning 1830, he founded the *Revue Républicaine,* the *Revue Indépendante,* the *Journal du Peuple,* and *Réforme,* himself writing chiefly against slavery. Under the republic, he held office, was prominent in legislation, and voted with the extreme left. Forced to surrender himself on the barricades 1851, Dec. 2, he was exiled, refused Louis Napoleon's amnesty, returned to Paris 1870 as colonel, organized troops during the siege, and, after the capitulation, became active in the assembly.

SCHOFIELD, *skō'fēld,* JOHN MCALLISTERS: military officer: b. Chautauqua co., N. Y., 1831, Sept. 29; d. 1906. He graduated at the U. S. Military Academy, and was brevetted 2d lieutenant 2d U. S. artillery 1853, and in the regular army was promoted 2d lieutenant 1st U. S. artillery the same year; 1st lieutenant 1855, captain 1861, brigadier-general 1864, brevet major-general 1865 for services at Franklin, Tenn., and major-general 1869, and on the death of Gen. Philip H. Sheridan, 1888, became major-general commanding the U. S. army. In the volunteer army he was appointed major 1st Missouri infantry 1861, was promoted brigadier-general the same year, and major-general 1862, and was mustered out of the volunteer service 1865. He was principal assistant professor of natural and experimental philosophy at the U. S. Military Academy 1856-60; superintendent of the academy 1876-81; commander of the district and department of Missouri 1862-64, the Army of the Ohio, the 23d corps in the Georgia campaign, the forces that defeated the Confederates under Hood at Franklin 1864, Nov. 30, and at Nashville soon afterward, the department of North Carolina 1865, Feb.—June, and the 1st district of Virginia 1866-7. He executed the terms of the convention for the surrender of Gen. Johnston's army 1865; was secretary of war *ad interim* 1868, May—1869, Mar.; and became commander of the department of Missouri 1869, the division of the Pacific 1870, the new military division of the Pacific 1882-3, the division of the Missouri 1883, and the division of the Atlantic 1886. He was president of the new tactics board 1870, and of the Fitz John Porter inquiry board 1878; was president of the Military Service Institution three times; 1895 he was made lieutenant-general and Sept. 29 was retired.

SCHOLAR, n. *skōl'ėr* [L. *schola;* Gr. *scholē,* employment of leisure, philosophy, a school: Dut. *scholier;* Ger. *schüler,* a pupil; Ger. *schule,* a school]: one who learns of a teacher; one who has attained a certain advanced proficiency, as in learning; a pupil; a student; a man eminent for learning; an undergraduate partly supported from the revenues of his college. SCHOL'ARLY, a. *-lĭ,* resembling or becoming a scholar. SCHOL'ARSHIP, n. learning; knowledge; erudition; the character and qualities of a scholar; a foundation for the support of a student.—SYN. of 'scholar': pupil; learner; disciple; savant.

SCHOL'ARSHIP: benefaction, generally the annual proceeds of a bequest permanently invested, paid for maintenance of a student at a university or college. In the Eng universities of Oxford and Cambridge and their colleges are numerous scholarships in value from £20 to £100 per annum. In both universities, the scholars are chosen from the undergraduates, and are often elected before they have begun their attendance at the univ. They are on the foundation, but their connection with the college is not so intimate as that of the fellows. The regulations and the advantages differ in the different colleges. A number of the scholarships which were formerly restricted have recently been thrown open to public competition. The Bursaries (q.v.) of the Scottish universities are nearly analogous to the Scholarships of the English.

In the United States, scholarships have been a favorite form of benefaction, on the part of wealthy givers and testators, even to the extent of embarrassing many colleges that need the gifts much more for a general endowment to meet innumerable expenses. In some instances a donation for building, even, has been coupled with the condition that tuition fees shall be remitted to the amount of the interest on the donation. It has been asserted that in this country every student worth educating can better make his own way. Still, a certain proportion of free scholarships are undeniably helpful to many earnest students—a proportion in regard to which the benevolent might well confer with the college authorities. Scholarship funds usually range from $500 to $1,000, though in many cases larger.

SCHOLASTIC, a. *skō-lăs'tĭk*, or SCHOLAS'TICAL, a. *-tĭ-kăl* [L. *scholas'tĭcus*, of or belonging to a school, a lecturer in the schools, a rhetorician—from *schola*, a school (see SCHOOL)]: of or pertaining to a scholar, or to a school; pertaining to the schoolmen; pedantic. SCHOLAS'TICALLY, ad. *-lĭ*. SCHOLAS'TIC, n. one who adheres to the methods and subtleties of the schools. SCHOLAS'TICISM, n. *-tĭ-sĭzm*, the methods or subtleties of the schools of philosophy of the middle ages; scholastic philosophy or formality. SCHOLASTIC PHILOSOPHY, that system of philosophy which arose in the schools and universities of the dark or middle ages.

SCHOLAS'TICS, or SCHOOL'MEN: originally the teachers of rhetoric at the public schools under the Roman empire; now denoting almost exclusively the so-called philosophers of the middle ages. After the fall of the old classic civilization, there ensued a long anarchy of barbarism, from the 6th to the 8th c.; but from the time of Charlemagne a visible improvement took place. That great monarch encouraged learning; and the monasteries as well as the schools which he established became subsequently the seats of a revived culture of philosophy. Conformably, however, to the spirit of a time in which learning and literary skill were confined to churchmen, philosophical activity showed itself chiefly in the domain of theology. This preparatory period of scholasticism (9th–11th c.) embraces the distinguished names of Johannes Erigena Scotus (see ERIGENA), who cannot, however, be properly classed among the Scholastics:

Gerbert of Aurillac, afterward Pope Sylvester II. (q.v.); Berengarius (q.v.) of Tours; and Lanfranc (q.v.), Abp. of Canterbury. A further development of scholasticism occurred toward the middle of the 12th c., when Roscellinus (see ROSCELIN: NOMINALISM) opened the question concerning the nature of universal conceptions, which led to the great struggle between the *Nominalists* (q.v.) and *Realists* (q.v.). This struggle terminated in the triumph of the latter; and henceforth, during the golden age of scholasticism (the 12th and 13th c.), realism continued the prevalent mode in philosophy. Still, however, scholasticism regarded philosophy as dependent on theology. No one doubted or at least disputed the truth of any of the church doctrines. These were alike too sacred and too certain to be so handled; and the only thing left for a humble philosopher to do was, in fact, to sort and systematize them: hence the expression *philosophia theologiæ ancilla* (philosophy is the handmaid of theology), which has found its way down to modern times. Whatever did not directly belong to ecclesiastical dogma was either neglected or treated in accordance with the vague traditions of Platonic or Aristotelian thought handed down from antiquity. Hence sprang that vast array of artificial subtleties and distinctions which had no better foundation than gross ignorance of the matters discussed, combined with restless speculativeness. The formulas of logic were abused through an irrational realism, which regarded them not only as a means to the attainment of philosophical knowledge, but as the material organon of philosophy itself. At first, the dialectic treatment of dogma was only fragmentary, as we see it in the principal Scholastics of the 12th c., Gilbert de la Porrée, Alanus ab Insulis, and Petrus Lombardus (q.v.). During the 12th c., however, the increased intercourse of the West with the Arabs and Greeks led to more definite acquaintance with the physical and metaphysical writings of Aristotle, though still only through the medium of incomplete translations, and in this way the circle of vision of the Scholastics at least widened, if it did not become clearer. From this period dates the almost *papal* authority of the great Stagyrite in philosophy, and the rise of the vast and elaborate systems of mediæval theology. The three chiefs of scholasticism in this, its highest development, were Albertus Magnus (q.v.), Thomas Aquinas (q.v.), and Duns Scotus (q.v.); around each of whom stand groups of more or less independent scholars and followers. The celebrity of such teachers was largely increased by the lack of books, which compelled their pupils to rely on their oral communications and necessitated those extraordinary public disputations which were the only means 'philosophers' had of advertising their wares in the middle ages. The honor paid to them by their admirers is visible in the epithets attached to their names; thus, Alanus is the *Doctor universalis;* Alexander Hales (q.v.), the *Doctor irrefragabilis;* Duns Scotus, the *Doctor subtilissimus;* Thomas Aquinas, the *Doctor angelicus;* Guillaume Durand of St. Pourcain, the *Doctor resolutissimus*, etc.

SCHOLASTICS.

With Thomas Aquinas and Duns Scotus, scholasticism culminated. After their time, various causes co-operated to bring its decline and fall. The mystical theology (see MYSTICISM) gradually developed its natural antagonism to speculations resting on a basis of formal logic, and not appealing to the human heart and spirit. Such men as St. Bernard (q.v.) of Clairvaux, and the monks of St. Victor at Paris, in the 12th c.; with Bonaventura, in the 13th, were unconsciously hostile to the dominant style of thought; while in the 14th and 15th c., Tauler, Thomas à Kempis, Gerson, Nicholas of Clemangis, and others—deliberately set themselves against it. The very nature of the scholastic thought was inimical to its own perpetuity. The hyper-logical, hair-splitting course which it followed produced rival systems, and results discordant with the doctrines of that theology which it undertook to support; until it finally laid down the astounding proposition that a thing might be philosophically true and theologically false, and *vice versâ*. The quarrels of the two great orders—the Dominicans and the Franciscans—each of which took part with its metaphysical chief; the former being called Thomists (from Aquinas), and the latter, Scotists (from Duns Scotus), materially injured the common cause of scholasticism; and the revival of Nominalism under William of Occam (q.v.), its most distinguished advocate, powerfully contributed to the same result; but it was not till after the revival of letters had done its work of enlightening the judgment and purifying the taste of Europe, that scholasticism was visibly in danger. The Reformation shook the system to its foundations—Luther himself leading the assault with the strength and valor of a Cœur-de-Lion; but still, so tenaciously did it cling to the semblance of life, that in the universities it held its footing till the 17th c., and even later. In fact, in some Rom. Cath. states, e.g., Spain, it is still almost the only philosophic mode. The two great intellectual reformers whose writings mark the transition from the mediæval to the modern mode of thought, are Lord Bacon (q.v.) and Descartes (q.v.), who may be said to have administered the death-blow to scholasticism. The literature of this phase of speculation is enormous, and few critics have ventured far into its cob-webbed regions. For instance, the printed writings of Albertus Magnus, Thomas Aquinas, and Duns Scotus, amount to 51 folio vols.; but however glad we may be that the reign of scholasticism is over, and however thankful to men like Laurentius Valla, Erasmus, Rudolf Agricola, and Ramus, who riddled its ancient and time-honored flag with the sharp shot of their wit and logic, we ought never to forget, that in ages when the conditions of scientific knowledge or refined taste did not exist, these old monkish dialecticians kept alive the philosophical faculty in Europe by the vivacity and restless ingenuity with which they prosecuted their fantastic speculations.

SCHOLIAST, n. *skō'lĭ-ăst* [Gr. *scholĭastēs*, a writer of explanatory notes; *scholĭŏn*, a short note, a comment; *scholē*, leisure, philosophy]: a commentator or annotator. SCHO'LIAS'TIC, a. *-ăs'tĭk*, pertaining to a scholiast, or to his pursuits. SCHO'LIUM, n. *-ŭm*, plu. SCHO'LIA, *-lĭ-ă*, or SCHO'LIUMS, *-ŭmz*, an explanatory note or criticism written on the margin of a MS. by one of the anc. critics; an explanatory remark appended as a footnote to the demonstration of a proposition, or to a train of reasoning.

SCHOLTEN, *skol'tĕn*, JOHANNES HENDRIK: theologian: 1811, Aug. 17—1885; b. Vleuten, Netherlands. He graduated with high honors from the Univ. of Utrecht, was pastor at Meerkerk 1838–40, prof. of theol. at Franeker 1840–43, and in the latter year took a similar professorship at the Univ. of Leyden. He founded the rationalistic school of Dutch theology, and exerted a powerful influence on the religious thought of Europe. He was several times elected rector of the univ. His official connection with the institution closed 1881. Among his numerous works were *Doctrine of the Reformed Church*, 2 vols. (1848–50); *The Gospel of John* (1864); and *The Pauline Gospel* (1878).

SCHOMBERG, *shom'bĕrch*, FREDERICK ARMAND, Duke of: soldier: about 1619–1690, July 1; b. Heidelberg, Germany; son of Count S. He served in the Swedish army during part of the Thirty Years' War, for which his estate was confiscated by the emperor; served under Frederick Henry, Prince of Orange, till the death of the latter; entered the French army, and was promoted till he reached the rank of marshal. For his aid to the Portuguese in their conflict with Spain he was awarded 1668 a pension of £5,000 a year. On account of the revocation of the edict of Nantes, 1685, he was obliged to leave France. After spending some time in Portugal and Holland, he went with the prince of Orange, 1688, as second in command of the army in the expedition to England; was created a baron, marquis, and duke; was knighted and given £100,000 by the house of commons 1689; and the same year was in command of the army sent against James II. in Ireland. Of his action in this campaign widely differing views are held. He was killed at the battle of the Boyne. Dean Swift wrote a Latin inscription for the monument erected to him in St. Patrick's Cathedral, Dublin.

SCHOMBURGK, *shom'bĕrk*, Ger. *shom'bûrk*, Sir ROBERT HERMANN: traveller: 1804, June 5—1865; b. Freiburg in Prussian Saxony. In early life he was for a short time resident in Va.; but having interested himself in geog. and nat. history, he was sent to survey Guiana (see *Journal*, Royal Geog. Soc.; *Travels and Researches in Brit. Guiana* in 1835–39—London, 1840). In this survey he discovered the aquatic plant *Victoria Regia* (q.v.). His *Description of British Guiana* was the fruit of his second expedition commissioned by the Brit. govt. for boundary survey, etc.; for which he received knighthood. In 1847 he pub. *History of Barbadoes*; and 1857–64 was Brit. representative to the Siamese court.

SCHÖNBEIN, *shön'bīn*, CHRISTIAN FRIEDRICH, German chemist: 1799, Oct. 18—1868; b. Mitzingen in Würtemberg. He studied natural science at Tübingen and Erlangen, and afterward in England 1826, and in Paris; and 1828 he was called to a chair in the Univ. of Basel, where he soon gained repute. In 1839 he discovered *Ozone* (q.v.) and 1845 invented *Gun-cotton* (q.v.), obtaining from it by dissolution in ether the material Collodion (q.v.). His later experiments were chiefly with oxygen.

SCHÖNBORN, *shön'born*, FRANCIS VON, Count: Roman Catholic archbishop: b. 1844; son of Count Erwin von S. He received a military education, entered the Austrian army and served in the campaign of 1860, but afterward studied for the priesthood. He was ordained a Rom. Cath. priest 1873, was rapidly promoted, became bp. of Budweis, Bohemia; and on the decease of Cardinal von Schwarzenberg 1885, succeeded him as Abp. of Prague.

SCHÖNBRUNN, *shön'brûn:* royal palace in the outskirts of Vienna (q.v.), summer residence of the Austrian imperial family.

SCHÖNEBECK, *shö'nĕh-bĕk:* manufacturing town of Prussian Saxony, 9 m. s.e. of Magdeburg; on the left bank of the Elbe. The chemical works, which give employment to about 400 men—the salt refineries, where the brine obtained from the abundant salt-springs is boiled down, and salt made to the annual amount of 70,000 tons—and the breweries and distilleries, are the principal industrial establishments. Pop. 16,250.

SCHOODIC LAKE: see GRAND LAKE (Me.).

SCHOOL, n. *skôl* [AS. *scolu*, a school—from L. *schola;* Gr. *scholē*, leisure given to learning, a school]: place for instruction of pupils; the collective body of pupils (see—throughout this series of titles—EDUCATION: EDUCATION, NATIONAL OR STATE:—also the references: INDUSTRIAL SCHOOLS: COLLEGE: UNIVERSITY: ETC.): a sect or party in doctrines or philosophy; those who have or hold something in common, as *old school;* the colleges in the middle ages for instructing in the various branches of speculative knowledge; a shoal or compact body, as of whales: V. to instruct; to train; to tutor; to reprove. SCHOOL'ING, imp.: N. instruction in a school; reproof; reprimand. SCHOOLED, pp. *skôld*. SCHOOL'MAN, n. one versed in the speculative philosophy and divinity of the middle ages. SCHOOLMEN, n. pl. the philosophers and divines of the middle ages, from about the 9th c. to the revival of learning, about the end of the 14th c. (see SCHOLASTICS). SCHOOL-MASTER, n. *skôl'mâs-tĕr*, one who teaches a school. SCHOOL-MISTRESS, n. fem. *-mĭs-trĕs*, a woman who teaches a school. SCHOOL-BOY, a boy learning at school. SCHOOL-GIRL, a girl at school. SCHOOL-DAYS, the time when at school. SCHOOL-FELLOW, or SCHOOL-MATE, a companion at school. SCHOOL-HOUSE, the building where the school is held. SCHOOL-INSPECTOR, a government officer appointed to make periodical examinations of elementary schools. SCHOOL DIVINITY

that divinity which discusses nice points in doctrine. ARMY SCHOOLS (see SCHOOLS, REGIMENTAL). BOARD SCHOOL, a public elementary school established under act of parliament, and under the management of a board elected by the rate-payers. CHARITY SCHOOL, a school where poor children are educated, and partly or wholly fed and clothed, gratuitously. CLASSICAL SCHOOL, a school in which Latin and Greek are taught. COMMERCIAL SCHOOL, school for instruction in all branches specially pertaining to a commercial or business career. DAY-SCHOOL, a school where children are taught daily, but not boarded. DENOMINATIONAL SCHOOL, a public school erected, maintained, and managed by a religious denomination, and subsidized from government grants when under state inspection. DIOCESAN SCHOOL, a school under the inspection of the bishop of the diocese. ENDOWED SCHOOL, one wholly or partially supported from permanent sources. FREE SCHOOL, one in which the pupils are taught gratuitously, as directed by the will of the founder and endower. GRAMMAR SCHOOL, in *Britain* (see GRAMMAR SCHOOL); in the *United States*, the school next in grade below the high school in the graded system of common schools—the usual grades being primary, grammar, and high, with an intermediate grade in some places between primary and grammar schools (see EDUCATION, NATIONAL OR STATE—in the United States). INDUSTRIAL SCHOOL, a school in which children who might otherwise become criminals are fed, clothed, lodged, educated, and instructed in some industrial employment for a certain number of years. INFANT SCHOOL, one for young children under seven. MIXED SCHOOL, a school in which both boys and girls are taught together in classes. NORMAL SCHOOL, a school for the training of teachers. PAROCHIAL SCHOOL, in *Scot.*, a school established in each parish by the compulsory statute of 1696, and supported by the landholders, who, in Scotland, are called *heritors*—now transformed into a board school under the act of 1872. PRIMARY or ELEMENTARY SCHOOL, a school where children receive elementary instruction. PRIVATE SCHOOL, a school wholly maintained and managed under private or individual enterprise, generally for the children of the better classes. PROPRIETARY SCHOOL, a private school maintained and managed by a board of proprietors. PUBLIC SCHOOL, one of the great foundation schools of England, such as Eton Rugby, etc. (see SCHOOLS, PUBLIC AND GRAMMAR—in England): an ordinary school supported from the taxes. RAGGED SCHOOL, a school for the very poorest and most destitute children. REFORMATORY SCHOOL, an institution for the training and reformation of young criminals. TECHNICAL SCHOOL, an institution in which the arts and sciences are taught, with their practical application.

SCHOOLCRAFT, *skôl'krâft*, HENRY ROWE: author, geologist, and ethnologist: 1793, Mar. 28—1864, Dec. 10; b. Watervliet, N. Y. He entered Union College in his 15th year, and studied French, German, Hebrew, chemistry, and mineralogy. 1817-8, he visited the mining region w. of the Mississippi, sent a collection of minerals and geological

specimens to Washington, and wrote *A View of the Lead Mines of Missouri*, etc. (8vo, New York 1819), and a narrative, since enlarged, *Scenes and Adventures in the Semialpine Region of the Ozark Mountains of Missouri and Arkansas* (8vo, Philadelphia 1853). In 1820 he was appointed geologist of an exploring expedition to the Copper Regions of Lake Superior and the upper Mississippi. He wrote *Travels in the Central Portion of the Mississippi Valley* (8vo, New York 1825). In 1822 he was appointed Indian agent for the n.w. frontier, and established himself at Sault Ste. Marie. In 1823 he married Miss Johnston, grand-daughter of an Indian chief, who had been educated in Europe. At this period he applied himself to the study of Indian history and ethnology. 1828-32 he was in the legislature of Michigan Territory, and founded its Historical Society. For his Lectures on the Indian Languages he received the gold medal of the French Institute. He produced several poetic works; also a grammar of the Algonquin language. In 1832 he was appointed to lead an expedition to the sources of the Mississippi (see *Narrative*—8vo, New York 1834). As superintendent and disbursing agent for the Indians, Schooley negotiated treaties by which the government acquired lands to the extent of 16,000,000 acres. He visited Europe, 1842. In 1847 he was married a second time. In 1845 he collected the statistics of the Six Nations, and published *Notes on the Iroquois*, etc. (8vo, Albany 1848). In 1847 congress authorized his publication of *Historical and Statistical Information concerning the History, Condition, and Prospects of the Indian Tribes of the United States, in six volumes quarto; with 336 Plates by Major Eastman and others* (Philadelphia 1851-57). He published also *Algic Researches; Thirty Years with the Indian Tribes of the North-western Frontier; The Indian in his Wigwam*, etc.

SCHOOL-GARDENS. *History.*—The school-garden came into existence in response to a belief that education from text-books was entirely insufficient to meet the needs of civilization. A purely text-book education was found to leave people devoid of needed contact with the materials with which much adult life contact was essential. In horticultural communities the earliest school-gardens attempted to lay a basis for a study of horticulture; in dairying communities they related largely to the dairy, and in agricultural communities they became at the outset means of instruction in agriculture, while in certain localities they were used primarily for instruction in botany.

Perhaps the most significant recent change in educational practice is the attempt to make all lines of education full of meaning to the people being educated. To secure the desired motive for doing things in school life there must be some relation between the doer and the thing done. This motive for the learner need not be the

ultimate motive held in the teacher's mind, but must be a motive of appreciable importance to the pupil. Knowing for the sake of knowing, or merely solving problems that arise, for the sake of conquest, of meeting the demands of one in whom there is confidence, in order to enjoy, to lead to further pursuits, or any other of the direct purposes may be the direct motive out of which an ultimate motive is secured. The school-garden, together with the laboratory, the shop, and field work, constitutes an important expression of this attempt to give significance and basis to the materials of education. Expressed in other words, it may be said that education to become more efficient must come to bear more relation to the world in which we live. This relation can be established only by a larger amount of direct contact with materials and with life in its many manifestations. This contact, while affording endless opportunities for development of trustworthiness in inferential judgment, lays the foundation in concrete experience for all lines of education.

It must not be assumed that those who earliest conceived the idea of the school-garden had in mind only that garden contact which should instruct in the different lines of industrial life to the end of making artisans. It is recorded that the Persian King Cyrus organized regions 'in which the sons of noblemen were instructed in horticulture,' and during the reign of this king, gardens for educational purposes were established by other persons in high government positions. From the time of Cyrus until the 16th c. practically nothing was recorded as to work in this line. Comenius, the Moravian educator of the latter part of the 16th and early part of the 17th centuries, wrote in his *Didactica Magna:* 'A school-garden should be connected with every school, where children at times can leisurely gaze on trees, flowers, and herbs, and be taught to enjoy them.' But although numerous attempts were made, this 17th c. garden idea did not become established until in 1869 and 1870, when, largely to the response of Erasmus Swab, there was passed in Austria imperial legislation which required that there should be in connection with each school a garden for instruction in natural history. Considerable aid was given to the development and popularization of proper standards of work through the presence of a fully equipped school-house and garden at the Vienna Exposition in 1873. Many thousands of school-gardens now exist in Austria as the direct result of this work, which began in that country a little more than 30 years ago.

In certain large German cities school-gardens were established as early as 1840, but these assumed little significance until within the past twenty years, when they have become common to all schools of Germany. As yet the garden has not become recognized as an

organic part of the government school system in Germany, although its use is almost universal.

During the past 25 years the agricultural society of Switzerland has been active in advocating and assisting in garden work in connection with regular school work. The general government has made an appropriation of a large sum of money to be used in establishing model gardens, and also in giving direct assistance to schools for this work. Belgium has a law making horticultural teaching compulsory, and gives more than $1,000 annually as prizes to students for excellence in practical horticultural work. This work is carried on extensively in Sweden, France, England, and Russia. Most of these countries appropriate considerable sums of money to support gardens and also require teachers to be especially trained to teach in the gardens.

In the United States, the garden as a factor in educational work is but little more than a decade old, but its extension during this brief period has been phenomenal. It has extended into every state and is more or less used by every kind of elementary school and many secondary schools. In several cities, such as Philadelphia, Boston, New York, Rochester, and Cleveland, the city officials or city improvement associations have appointed supervisors of garden work. These work in direct connection with the ordinary city officials or with improvement associations, settlement leagues, civic leagues, etc., dependent upon peculiarities of organization and purposes held in mind by those establishing the gardens. The United States Department of Agriculture maintains a large school-garden at Washington, publishes bulletins upon the subject, distributes seeds, and otherwise renders assistance to any institution attempting garden work of any kind. Many of the state agricultural colleges and experiment stations maintain gardens and co-operate with school authorities in directing the work. In some parts of Canada special school-garden supervisors are appointed, each of whom has charge of the work in a large number of schools.

Purposes.—Much that is had in mind as to the general purposes of the school-garden is the same as will be found under the topic NATURE-STUDY and will not be repeated in this connection. The ancient Italian gardens were for æsthetic purposes purely, and partook of the nature of the public park floral displays so properly common throughout the United States today. Plants were grown in order that their attractiveness might be observed and enjoyed by the school children. The most striking plants were selected for use and the greater the peculiarity of the plant the more desirable it became for garden use. Such gardens were usually exceedingly formal in their arrangement, since according to the notions of the time an artificial formal arrangement was supposed to be much more artistic than a natural arrange-

ment. Furthermore such gardens were cared for almost entirely by gardeners, the pupils playing a very minor part in the work of producing or maintaining them. When plants were to be removed to the school room for decorative purposes, as occasionally happened, the work of transferring and adjusting them was done by the laborers, not by the pupils.

Another phase of the artistic value appears in many modern gardens in which pupils themselves are encouraged to select, arrange, and grow their plants so as to produce the best artistic effects. This commendable purpose has found expression in very many modern gardens and has resulted in surprisingly beautiful effects, but better than this it has stimulated the production of more beautiful home grounds. One has but to visit the lawn, back-yard, or neighboring vacant lot that have been transformed by school children in order to be convinced that if the æsthetic value were the only one the school garden is justified. Many a child and his parents have been led through the interest in the child's own work more nearly to appreciate the natural beauties of the general environment as well as the immediate home and school environment.

Æsthetic appreciation to some extent must grow out of an increasing knowledge of plants, plant processes, of animal and physical phenomena, yet this more purely educational aspect of garden work needs especial mention. The human race is dependent for its existence upon plant processes. They are the source of replenishment of our food supplies, and in a very true sense are the foundation of our industries. Plant products nourish man, his beasts of burden and domestic animals, and he uses them for food; they furnish him the lumber of his home, his fiber for much of his clothing, the pulp for his paper; they yield many of his commercial dyes, most of his medicines, and furnish many poisonous substances against which he must guard himself; associated with these plants are many injurious and many helpful animals which affect man's welfare. Certainly a knowledge of these things gives one a desirable point of contact with the basic factors in social and industrial life. Such a basis in concrete knowledge would render properly significant a good many topics to be studied in later education, which topics are too often mere abstractions because of absence of concrete experience.

Evidently this work involves a careful study of the nature, the growth, and the life habits of plants and animals, and some knowledge of how things live in and about a school-garden usually gives a valuable interest in larger life problems. It is not generally conceded that the school-garden exists primarily as a means of botanical instruction, although gardens do exist where such seems to be the sole purpose. In certain German cities the school-garden is used for no other purpose than to

1. School-Garden at Leipzig, Germany. Vegetables planted by the gardener for inspection by the pupils.
2. Individual School-Garden at Washington, D. C., showing pupils themselves planting seeds.

supply botanical materials for class-room study. In at least one large city the plants are placed in vasculi by the gardeners upon orders from the teachers and delivered to the school-rooms, the pupils having nothing to do with the growing plants or with the observing of them in their processes of growing. At another extreme from the case just cited are the many purely industrial gardens in which the pupils do all the work and throughout it are taught to look only for the economic results that may come from proper maturation of their plants.

The great purpose is to be found in the education and development of the pupils themselves. In addition to the benefits suggested above, out-door work of a most healthful sort is offered, i.e., exercise out of doors that looks toward a valuable and interesting and appreciable end. Working with one's fellows, observation, comparison, and friendly criticism as to design of plantings and cultivation are fostered. The necessity of care and industry and intelligence are emphasized by the diligent and by the negligent. The only way to secure a true notion of values, namely, by producing something valuable, is exemplified in the garden. The attitude of young people toward money has changed in this prosperous country until to many the price of a dollar is estimated largely by the trouble of asking of the parent and presenting some fairly plausible excuse for securing it. When a boy has secured a dollar by planting, cultivating, harvesting, and marketing a dollar's worth of radishes he gets some notion of values in terms of expenditure of thought and energy. Furthermore, to city boys and girls the garden offers in a small measure restitution for deprivation of the opportunity, even necessity, of the country boy and girl for learning faithfulness to duty through the constant and regular performance of small pieces of work. Virility of character rests upon ability to do promptly a task when the time for its doing arrives. This ability, like any other, develops only through exercise, and it cannot be doubted that much of the perhaps overrated sturdiness of character of country boys and girls comes from the fact that they have learned to be faithful to regularly recurring duties. Not a few cases are recorded of unpromising boys who were given purpose which developed into self-control through the appeal of the school-garden. Some of these boys were the too frequently met types of street boys who for some reason, usually some educational deficiency, had no motive purpose. Such boys are appealed to through stimulating the desire to produce something of value and then furnishing the means of working out this desire to the full limit of the boy's powers. Each city where school-gardens have been properly fostered for some years can cite cases of useful citizens who were first given real community and industrial life through initial garden work. The garden is not commended as a panacea

for wayward boys, but its influence in this connection is not negligible.

A community may be so closely dependent upon a certain kind of work that its inhabitants may look with favor upon a feature of the educational system that teaches pupils the rudiments of the work that gives them sustenance. In Holland, Belgium, France, and Switzerland, attention is directed rather definitely to the main industrial interests of each country respectively, the avowed purpose being to teach the children how to make a living. In the United States in agricultural communities there is a strong tendency toward making the school-garden, and in fact all elementary science work a means of agricultural instruction. In the community gardens in larger cities, under management of settlement leagues, etc., the work has usually been industrial, though often decorative.

In European countries, most of the larger gardens present a display of plants in such ways as to show the various artificial and natural groupings for observation and study by the pupils. In some of these one finds nearly all the kinds of herbaceous and shrubby plants that can be grown in that climate, arranged in systematic order and each properly labelled. One section is often given to plants indigenous to the region, and these are studied to give the pupil acquaintance with his native plants. In such gardens one usually finds, also, a section given to economic plants as flax, hemp, banana, cotton, pine-apple, century plant and others which with these produce our fibers; other sections contain poisonous and medicinal plants; others contain typical hydrophyte or alpine plant societies, all of these including such animal life as may thrive without injury to the plants.

There is a fairly universal opinion that the best service cannot be given by the school-garden unless, whatever else it may involve, it also involve the idea of being a place where children may do first-hand work with the soil, with plants, and perhaps with such animal life as is present. It is almost equally universally agreed that the garden must provide separate plots so that the individual child may feel ownership in the results of his work. Most children can be stimulated to motives of production of common property for a time, and practically all are glad to contribute regularly to producing a feature of common interest such as a common bed of flowering plants; but the normal child desires to feel ownership in his own work, and to secure the most valuable ends from school-gardens the individual must have his own area. In this, under judicious consultation on the part of the teacher, the pupil can make his own design for planting, and cultivate and harvest his own products. This makes the individual plot the unit of the garden—not the entire garden. Such often produces striking results, when the entire garden is considered—

as when a plot, half petunias and half marigolds, may lie alongside one in which a dozen kinds of vegetables are grown. But such a condition presents nothing inconsistent with the larger purposes of the work. It is far better to have a small number of the grades of a given school engaged in this work than to relinquish the individuality and ownership idea, if the work is to be attempted in any large and serious way. Of course, a group of pupils could undertake as a common enterprise the task of clearing the rubbish from an unsightly corner, and planting it in decorative plants. Even then, unless some definite and small number of individuals are responsible, the plantings may suffer. It is quite possible to add general features of common interest to a garden, the fundamental unit of which is the separate plot owned for the time by the individual pupil, but it is not possible to realize many of the purposes assigned unless separate plots are provided for.

One of the most difficult aspects of carrying on school-garden work is found in the small number of teachers trained to give such instruction. Many attempts have failed because of the unpreparedness of the teacher. For this the teacher cannot be censured, because the schools in which most of them have been trained do little or nothing to prepare them for this work. In absence of proper training, successful work may be done by following directions given in numerous publications, as Hemenway's *How to Make School-Gardens;* the publications of the McDonald institute, Guelph, Ontario; Hodge's *Nature Study and Life*, and the publications upon this question by the United States Department of Agriculture, in which are given extensive bibliographies of the subject.

SCHOOL ORGANIZATION AND ADMINISTRATION: in American cities the management of the public schools is in the hands of citizens who serve without remuneration. The tendency is to have small boards of education rather than large ones. The task of administering the system of public schools is both difficult and laborious. The wise expenditure of millions of dollars per year, the erection of expensive school buildings, repairs to the old buildings, the selection and purchase of text books and school supplies, the appointment of teachers, their supervision, and transfer—all these constitute features of a business of great magnitude, which requires business talent, good judgment, and experience. It involves an immense outlay of labor and time.

No statutory law enforces itself. Its success depends on the men who are to carry it out. Without the aid of intelligent and strong men in the board, the principal features of any law will remain inoperative.

Recent school legislation represents a departure in the principles of school administration. It originated in the fact that within the last fifteen or twenty years public opinion has pointed out certain defects in city school

management. For their correction better laws have been adopted in a number of cities and new principles of administration have been introduced.

The new laws adopted in various places, while differing in many details, agree in substance and may be outlined as follows: A small board, elected or appointed, to represent not wards or school districts, but the whole city; the work of the board to be legislative and supervisory; executive duties to be placed in the hands of salaried officers to whom adequate power is given so that they may be held responsible for the conduct of the public business, and the responsibility definitely fixed. With a small board there is not the tendency for displays of oratory, but a business-like discussion of vital questions.

The Superintendent is the Expert Adviser of the Board.—In order to hold the respect of his teachers, the superintendent should be a man of good scholarship and address. In order to command the respect of the board, he should be a clear-headed, forceful business man of considerable executive talent, fertile in resources, with a thorough command of ready information concerning the schools. His success will depend not only upon his attainments, but in an even higher degree upon his personality. He must possess tact and at the same time executive boldness. Above all things, he must have the courage of his opinions. The board looks to him for advice in all educational matters, and his advice will be respected, if intelligent, candid and independent, and guided altogether by the interest of the schools and never tainted by the wish to please or the fear to offend. He must be able to take a large view of pending questions, of forming clear plans and of patiently carrying them out, even if it should require years to give them fruition. If the professional advice of the superintendent is to be of value, it may be best obtained by encouraging independence and sturdy manhood.

Plan of School Work.—The plan of school work should be that of distributed responsibility by holding the principal directly responsible for the success or failure of his or her school as to general management, correct methods of instruction, and helping the assistants in the performance of their duties. In like manner the assistant is directly responsible for the management and advancement of the pupils in her room. In all this work the very greatest freedom should be exercised by principals and teachers consistent with sound methods of instruction and proper discipline.

To create higher ideals in teaching, to manage rationally and judiciously, to gather in the best from all sources, and to utilize it in teaching the children of a system of schools, to discover original methods of instruction and presentation, to create a stirring enthusiasm and healthy rivalry, ought to be encouraged in every

proper and possible manner. The principal makes the school or unmakes it.

Discipline.—No mechanical rules can be given for the government of children, yet there are certain broad directions which may be adopted as working principles that will help very considerably in controlling a very large majority of children. The exceptional cases must be treated individually. The children in a school may be divided into three marked classes: (1) the good; (2) the well meaning; and (3) the bad. The first class is always much larger than the third class. A little tact on the part of the teacher will unite the first and second classes in doing the right, rather than driving the second class into the ranks of the third class. Children feel isolation keenly, and the esteem in which they are held by their associates has much to do with their conduct.

When the teacher has succeeded in uniting the first and second classes firmly on the side of good order and cheerful study, the vicious pupils can then be won over in detail by the force of public sentiment among the other pupils, and by proper means employed by the teacher. A child can never be convinced of an error by forcing him under threats to be convinced. This is the old system once adopted by nations to convert heretics. It succeeds occasionally in extorting lip confession, but the heart remains unchanged. A bad boy may be reached, if the teacher can manage to look through the boy's eyes a while—at his own conduct. That is, the teacher must put himself or herself in the boy's place, and see his conduct as he sees it. To jerk a boy up to the teacher's plane of conduct that he may see the heinousness of his own deeds is likely to leave him dangling in the air without any foundation to dangle on, and he sets his wits to work devising how he may get to the ground once more. We will leave him there to his own reflections, and pass to other matters of discipline in the schoolroom.

The teacher controls more by the eyes than by the voice. Let us suppose a class is reciting, the teacher must stand or sit so as to see every member of the class reciting, and also see all the other pupils who are preparing their lessons. The habit many teachers have of standing with their backs to the pupils at their seats, while hearing a class recite, is a bid to the other children to engage in disorderly conduct. If the teacher must put work on the blackboard, such a position should be taken as will give a clear view of the entire room. It is the old story 'of one eye on the pot and the other up the chimney.' Prevention in infinitesimal doses at the right time is worth tons of cure when there is danger of a general uprising. In the midst of a recitation, the teacher observes two pupils at their seats earnestly engaged in conversation. Not wishing to disturb the other pupils, she moves quietly, yet apparently without a purpose, near where the two are sitting, and without saying a word the

pupils will become painfully aware of her presence. A steady look at the right time and in the right direction will be sufficient to repress tendencies to disorder. But how not to do it is as important on the other side. The teacher sees John whispering, and she says: 'John, are you whispering?' John replies: 'No'm,' a full fledged bid for lying.

Another cause of disorder is that of going round through the room and helping children to learn their lessons, or in having a continual string of them coming and going to ask the teacher questions about their lessons.

The right sort of discipline consists in getting each pupil to have a higher ideal in his own mind, and toward which he is continually approaching; or expressed differently, we must substitute a higher motive for a lower one in the mind of the pupil until he makes the substitution himself, and then endeavors to live up to his own notion of right. What is right with one may not be so regarded by another; but each has some standard of his own, and these standards differ widely. Here again the teacher must get near enough to the child to find out what his notion of right is. This is the starting point. No other will do. First know the disease, next apply the remedy, is sound doctrine. Each measures others by himself. Two extremes are to be avoided. The ends of these are: (1) Do right; (2) a multiplicity of rules prescribing all the down-sittings and up-risings of the pupils. The first is too general and too thin; the latter is too minute, and it sets the pupils to work to find something not specified. The cunning of the pupil is matched against that of the teacher. The effect is bad. The following are submitted as a middle course, and as being sufficiently comprehensive for the government of a school: (1) Regularity in attendance; (2) promptness in doing whatever is requested; (3) proper behavior on all occasions; (4) no communication during school without the consent of the teacher; (5) no unnecessary noise in the school room; (6) no immorality.

It is a good plan to have the children give their assent to these rules, explaining first what each means. They furnish a sort of chart or guide to conduct. If Washington, Jefferson, and Franklin saw the necessity of living up to rules, there is no reason why school children may not do likewise.

Teaching Power.—A school is judged to be in a good condition when all the pupils are intently at work, and the teacher has no occasion to reprimand or otherwise correct any pupil. The school is then in a true sense a workshop, in which each is attentive to his or her duty. It is the hum of business rather than the confusion arising from all sorts of noises. Without going into details, the teacher should first inspire the pupils with a controlling desire to obey and to learn—not surface learning, but to learn so as to understand each subject thoroughly. If it be a recitation in reading, the pupils are

all anxious to bring out their ideas as to how the sentiments ought to be rendered. Under position in reading, the teacher will observe the head, the body, the hands and the feet. A pupil ought not to read until he is in the proper position. Being in the right position, the teacher will see if the pupil is breathing properly. To know how to husband the breath in the emission of air from the lungs, and to convert all the escaping air into the proper qualities of voice, require constant and vigilant practice. Breathing embraces two acts—taking air into the lungs, and exhaling it from the lungs. The teacher must show the pupils how to inhale the air, and how to exhale it.

The Relations of Principals and Teachers.—The most cordial relations should always exist between the principal and the assistants. These relations are mutually reciprocal. To establish such a source of interchangeable helpfulness and dependence, unquestioned sincerity, united with kindness, gentleness, and forbearance, should distinguish and dignify all communications between both parties. In the widest sense the school is a co-operative institution in which the principal is the local center of power, and whose spirit should move all by one common impulse for the accomplishment of proposed ends.

The judgment of the principal must be of such nature as to command respect and to secure hearty and cheerful co-operation. The principal must also entertain liberal and comprehensive views, and be far removed from prejudice, envy, or littleness of any kind. There is no place to practice deceit to tide one over difficulties. For the truth will come out at last. Personal character, general intelligence, wide culture, well-balanced judgment, and polished manners are qualifications which the principal ought to possess. To these high personal qualities should be added a critical knowledge of the branches to be taught and the best methods of preparing the learner's mind for the reception of truth. There should be found, also, in both principal and teacher, that quality which is called magnetic. It attracts, but never repels. A repellent principal or teacher may hold a school in working order by mere physical force and intellectual might, but such a school is a lifeless machine run on an 'ice background.' Its chilliness is felt everywhere, and its cold fingers clutch and freeze out the sympathies of the school. Wherever the warm breath of inspiration flows freely in a school, the pupils and the teachers will attain the highest measure of success. Favorable conditions afford the best opportunity for willing and cheerful work. Every requirement for success in the principal should be as sharply pronounced in the mental and moral constitution of each teacher, and each teacher should be equally as competent to perform all the duties pertaining to her room as the principal is to have the oversight of the entire building.

But the principal's sphere of duties is much larger than

that of all the teachers combined. Their duties resolve themselves into two distinct classes: (1) Administrative; and (2) education. The administrative pertain to and include all the affairs not directly connected with the preparation and recitation of lessons and matters of school discipline. Among the chief administrative duties may be enumerated the oversight of the janitor in the performance of his legitimate service in taking care of the school property and premises, and avoiding meddling in neighborhood or other affairs, and to execute such orders as the principal may from time to time direct. The janitor and teachers should aid and assist the principal in all legitimate work, such as the exegencies of the situation may require.

The movements of the pupils at intermissions and at dismissals, and the general oversight of their conduct to and from school, are all matters belonging almost exclusively to the administrative department, directed by the principal. Likewise, seeing that all the teachers understand fully and intelligently the course of study and are instructed how to carry out its provisions satisfactorily in the true educational spirit; attending promptly to the sanitary conditions of the pupils with reference to the orders issued from time to time by the board of health; as well as making out all reports, according to prescribed forms and at definite times.

The educational duties fall under two classes, namely: instruction and discipline. By virtue of the position the principal occupies in the estimation of the public and of the school, a higher order of scholarship and executive ability is demanded than is required of the assistants. The solidity of scholarship, including intensity, area and volume, not mere technical quibbles, such as inflict pedantic grammarians and arithmeticians, which involve a very low species of scholastic fencing, should stand out conspicuously in the principal's mental acquirements. Sound scholarship is always able to dispose of special cases under a fuller and more comprehensive law. One, narrow in knowledge, and conscious of this weakness, soon becomes envious, suspicious, seeing pitfalls prepared on every hand for his destruction. Whereas, a broad and liberal view of questions and issues has a humanizing effect on every mind; but while those who never get glimpses of knowledge, except in patches, are destined to linger out their lives within an ever narrowing circle. The contracting mind never inspires enthusiasm, or commands respect. If to continually diminishing intellectual returns there be added a cold, negative, unsympathetic and cynical disposition, bristling with repellent forces, warmth would not be drawn from such a nature. Only the play of warm living force, attractive and not repellent, will inspire a school or a room. As the primary source of inspiration, the principal is at the head, and each assistant a generating center. Granting these con-

ditions, the first and most important point to be established by the principals and heartily seconded by all the assistants is to put the school on the best possible working footing, and then keep leveling up and never down. Furthermore, this unity of purpose can be effected only when the principal knows exactly the condition of each class in school, and all the teachers know definitely what is to be accomplished in all departments. It is hardly to be expected that every teacher will keep the school in all its details before her; yet it is indispensable that each should know what the school is engaged in doing each week.

As a working organism the school is a unit, and each teacher helps to complete this unity. This knowledge must not be a dim sort of knowledge, but a tangible, definite, exact kind of information which would enable the principal or any teacher to take hold intelligently in any class without loss of motion during any recitation. While the principal has the oversight of the entire school, and each teacher is always expected to take the best possible care of her own room, yet each should know the school as familiarly as has already been intimated. Teachers need most of all to know the school through all grades. The idea of piece-knowledge is not a healthful one, and besides has a tendency to break the school up into distinctly marked fragments, and to emphasize imaginary boundaries and subdivisions. Nearly all those personal antagonisms in school which come from exclusiveness in teaching will be eliminated by the adoption of the policy herein outlined.

Innumerable dangers lurk along the line of school government, managing disorderly pupils, meeting parents, and sending notes home. Many teachers are unfit to transact this particular kind of business with success. They too often say and do the wrong thing. In all cases of trouble or disagreement between the parent and teacher, the principal's advice should be sought, and as a matter of precaution, every note sent to a parent ought to be submitted first to the principal. The manner in which a thing is said or written makes a vast difference. Moreover the teacher is entitled to the advice of the principal in all matters of moment, and when both have consulted and agreed upon a line to be pursued, no room is left for a clash of authority. This support should be mutual and generous. When both thus act together and for each other, there is no opportunity afforded for censure. This, too, will save all those humiliating apologies when untenable positions are taken.

The situations in a school are continually changing. During no two days in succession are the conditions precisely alike, and how much more is this true of an incompetent teacher, whose room is in a state of anarchy. One of the most trying and critical positions in which a principal is placed is that of helping a weak, incompetent

teacher to pull her room into shape. A keen perception of what is needed and the remedies to be applied must first be decided upon by the principal before it is possible to change the congested condition of the room. After making a catalogue of the disorders to be remedied, or abated, the teacher, acting under the direction of the principal, should attack in detail, and thus conquer, by taking one evil after another till the school is reduced to order.

It may or it may not be wise to point out all the disorders at once. Here the principal needs to exercise great judgment as well as tact in bringing about a general betterment in instruction and discipline. A school is in every case an organic growth, and as such it should be studied. The different rooms performing specific functions constitute the several departments, but from the very nature of the school it is a complex organism, and the principal watches and directs its growth along the several lines of expansion. The teacher usually does not occupy such a position as to command a complete view, but is content to supervise one room only. But knowing all the departments as performing distinct functions tending toward a given end, the individual work can be easily pointed out in that direction. The principal is the selected leader, to lead the way to the high ground to be reached, and each teacher is to conduct her own classes along the route. The journey, figuratively speaking, is mapped out beforehand, and each starts her pupils along the line of march. It is a journey from ignorance to knowledge.

There should be no divided counsel in this matter. All should work with a singleness of purpose, and each in her own way, provided, always, that it is a rational and intelligent method of doing the work. Everything should be talked over fully and freely before the plan has been determined upon, but when it has once been agreed to, then each should give it undivided and hearty support. The time for discussion has passed. Many of the very best and most feasible undertakings are rendered nugatory by the half-hearted support they receive. Let there be a clear understanding on the point at the beginning, and it will be time-saving in the end.

New and unexpected conditions will arise, and the skillful principal or teacher is the one whose mind is so trained as to take in at a glance the present situation, and to do the right thing at the right time. Any system, however, should be elastic enough to bend without flying to pieces when new demands are made upon it. Each new case as it arises should receive individual treatment, and in such a manner as to preserve the discipline and general welfare of the school. A well defined line of action that will apply to ordinary as well as extraordinary conditions is imperatively demanded, but it is not often prudent to make announcements in advance. The rule-

making folly is to be carefully avoided. No teacher or principal ever accomplished much as a 'rule-maker.'

An unwritten law that has its source in the affections is much stronger than a code which prescribes the down-sittings and the up-risings of a school, although it be the 'code Napoleon.' Some simple rules and regulations are obviously necessary. They should be imbedded deeply in the two principles of justice and mercy. There is evidently more wisdom in keeping an open leeway than in being hampered with unnecessary rules and restrictions, which must be thrust aside every few days to avert peril.

Silent forces, in school work as in all other great movements, are the most powerful as well as the most lasting, and the resultant of these shows in the tendencies of our national progress in a very marked degree. By the side of this must be placed the relations governing ethical conduct. The idea of right concerning self and others is more important than progress in studies. Principals and teachers, therefore, should have clear perceptions of ethical relations, because so many questions requiring nice discriminations arise from day to day and have to be passed upon between teachers and pupils, or teachers and parents, or between pupil and pupil. Clear perceptions of right must form the background of action in all such cases. The ethical idea is built up gradually in the young mind, and it should have a firm setting in the home life long before the child enters school. This work is to be supplemented by the kind offices of both principal and teachers, and here, too, is a fertile field for the display of good judgment in discriminating between issues when there is a clash in opinions or conflict in interests. The principal and teachers always have many decisions to make in the interpretation of ethical relations. All such decisions are moral, and have reference to some definite end.

In concluding this discussion, certain guiding principles have been deduced, and they apply with equal force to principals and teachers in their relations to each other and also to the pupils in the school. The conditions necessitate, first, a clear understanding of what ought to be done; second, why it should be done; third, the best method of doing it. These questions all refer back primarily to the idea of duty as founded upon right in the constitution of the human mind.

SCHOOLS, Brothers of Christian: religious congregation in the Roman Catholic Church, established for religious and secular education of the poor; organized in France in the end of the 17th c. by the Abbé de la Salle, canon of the church of Rheims. The members are lay brothers, all subject to one general head. Houses of the order are found in almost every country of Europe. In France this congregation was one of those specially excepted from among the suppressed orders, and which were re-established by Gen. Bonaparte in the concordat of 1801.

It continues to flourish in that country; also in Belgium, Italy, s. Germany, Great Britain, and North America. The brethren are bound by the ordinary religious vows of poverty, chastity, and obedience. Their system of education has received high testimonials, and they are one of the most flourishing lay orders in the Roman Church, numbering, it is said, nearly 3,000 members. Besides this order of French origin, similar institutes have been formed under the same or analagous names in other countries.—SISTERS OF THE CHRISTIAN SCHOOLS, in the Roman Catholic Church, congregations of women for education of poor girls: a long catalogue of these, with history and specific constitution, is in Wetser's *Kirchen-Lexicon,* IX., 782-784.

SCHOOLS, PUBLIC AND GRAMMAR: endowed schools on ancient foundations. These, in England, are usually termed Public Schools; including Winchester, Eton, Harrow, Rugby, Westminster, Charter-house, Shrewsbury, St. Paul's School, and Merchant Taylors': see ETON COLLEGE; HARROW-ON-THE-HILL; RUGBY; ETC. More modern seminaries, instituted chiefly on the model of these, are Marlborough College, Cheltenham College, Wellington College, etc. Endowed Grammar Schools of old foundation exist in almost all principal towns of England, both for day pupils and for boarders. As almost all the independent and endowed grammar schools of England are taught by men whose notions of school discipline have been formed at one or other of the great public schools, these may fairly be added to those above enumerated as Public Schools. The course and methods of instruction, and the habits of life and of discipline, are substantially similar in all endowed English middle schools, whether called Public or Grammar schools. Many of these derive not only the *fixed* emoluments of the masters from old bequests, but also the means of boarding and educating a certain number of boys on the foundation. It was originally for these foundationers or collegians that a large proportion of the old schools were founded; but round them has grown up a large community of pupils from all parts of the British dominions, with tutors and keepers of boarding-houses. The foundationers consequently form simply the nucleus of these schools. The course of instruction is adapted to prepare for the universities. Latin and Greek form the basis; geography, ancient history, arithmetic, and mathematics being admitted to a subordinate place in the curriculum; though the school-time given to arithmetic and mathematics is now much greater than formerly, and modern languages and the elements of science are receiving larger attention. There are also tutors available at these educational seats for all usual branches, including music and drawing; but these subjects, being outside of the proper work of the school, do not affect the standing of the pupils. At Rugby, the school course includes *both*

French and German; and natural science is admitted as an alternative with these. In the more modern institutions, e.g., Marlborough, Cheltenham, and Wellington Colleges, attempts have been made to provide a modern course, parallel with the classical, for those boys who either show inaptitude for classical studies, or who are not preparing for the universities. Whether education in science and modern languages ought to be provided at the existing grammar and public schools is at present keenly debated; but this must be ultimately a question of finance. In Germany many of the gymnasiums provide a course of modern or *real* study, and this, combined with the wide diffusion of middle schools, under the name *Real-schulen*, meets all reasonable wants of those who do not intend a professional life. In France the *Lycées* provide an ancient and modern course, parallel with each other, for all pupils above a certain age. Under that age, all are taught the same subjects. In Scotland the number of middle schools in important towns, either established by private enterprise or by the town council or endowment, renders it unnecessary for boys to seek away from their homes the preparation either for the Scottish universities or for commercial life. The Scotch schools are elastic in their system, and all admit the modern element into their course of study; but the curriculum of study does not carry pupils so far as it ought, and the funds of the schools are wholly inadequate. See also GYMNASIUM; EVENING SCHOOLS; INDUSTRIAL SCHOOLS; EDUCATION, NATIONAL SYSTEM OF.

In the United States, great endowed schools, preparatory to a college and university course, are usually termed academies: see, as among the oldest of these, PHILLIPS ACADEMY (Andover); PHILLIPS EXETER ACADEMY; both under Congregational auspices, but non-sectarian. Some such schools are termed seminaries, e.g., Williston Seminary, at Easthampton, Mass. In recent years the number of well-endowed institutions of this high class, admirably equipped in both the ancient and modern courses of study, has very largely increased; a fine example is St. Paul's School (Protestant Episcopal), at Concord, N. H.—There are numerous institutions of a grade slightly lower—some for both sexes. Many of the public High Schools in cities and large towns also offer thorough training on an extensive course. For the Public Grammar School in the United States, see SCHOOL—*Grammar School.*

SCHOOLS, RABBINICAL: while before the destruction of Jerusalem schools for instruction in the law existed among the Jews, there are no definite data as to their organization and development, although the activity of the schools of Hillel and Shammai, which flourished in the last century of the era of the Second Temple, must have been pronounced and exercised much influence on Jewish thought. With the fall of the temple, however,

a new intellectual epoch began when Johanan ben Sakhai founded a school at Jabneh, which was to produce effects that were to last centuries. Around that leader and Gemaliel II. gathered prominent rabbis, who made Jabneh both school and tribunal. The subjects studied or elaborated at the academy were the canon of the Old Testament, the liturgy of prayer, the halakah and Biblical interpretation, while there developed the literature of Jewish tradition included in the Talmud and Midrash. The seal of the school was occasionally changed in later years, until it reached a state of splendor at Sepphoris, Judah, the compiler of the Mishnah, being its most illustrious head. In a later age the school was removed to Tiberias under Johanan B. Napcha, who died in 279.

Academies existed as well in Cæsarea and Lydia, but the school at Tiberias became the recognized seat of traditional learning and the successor of the olden Sanhedrin, and out of its discussions was framed the Palestinian or Jerusalem Talmud, and in a few centuries later, under the influence of the Masorites, the 'Tiberian punctuation.' Among the Babylonian Jews, Nehardea was a famous school of learning, Nisibis in northern Mesopotamia constituting a school of some importance. A college of equal rank to Nehardea under Samuel was founded by Rab in 219, and after Rab and Samuel passed away their pupil Judah ben Ezekiel founded a new academy at Pumbeditha. In the following century a school was founded by Raba, at Machuza. It was Ashi (d. 427), who gave new luster to the school of Sura, by beginning the work of revising and sifting the discussions of the Babylonian schools which was to produce later under his successors the Babylonian Talmud. Both Sura and Pumbeditha were long to remain schools of prominence, until the 8th and the 11th centuries respectively. The technical name for these academies was 'Yeshibah'—the attendance varied according to the fame of the school's head; thus Rab had 1,200 pupils, Ashi only 200. It was largely owing to Charlemagne's encouragement that schools were transplanted to France and Germany. In the 10th c. new academies were opened at Cairo, Kairwan (North Africa), and Cordova. France had its rabbinical schools at Narbonne, Lunel, Beaucaire, Marseilles, Troyes, and Paris; Spain had its academies at Cordova, Granada, Lucena, Toledo, Barcelona. Mayence had a famous school founded by Gershom (960-1028), with others in later centuries in Fürth, Metz, Altona-Hamburg, Frankfort, etc. Italy, Holland, Poland, furnished centers of rabbinical study. In northern France, in 1309, the school system included a higher and a lower school. The length of the term lasted seven years, the student dwelling in the school and receiving food and lodging. Every ten pupils had a special tutor. At the age of five boys were to enter the lower school, and were taught the Bible in Hebrew and

the vernacular. At ten he was to study the Mishnah, at thirteen the ordinary course was completed, special studies were continued until sixteen, when the student was to enter the higher school. A school tax of twelve pence yearly was imposed on every member of the community.

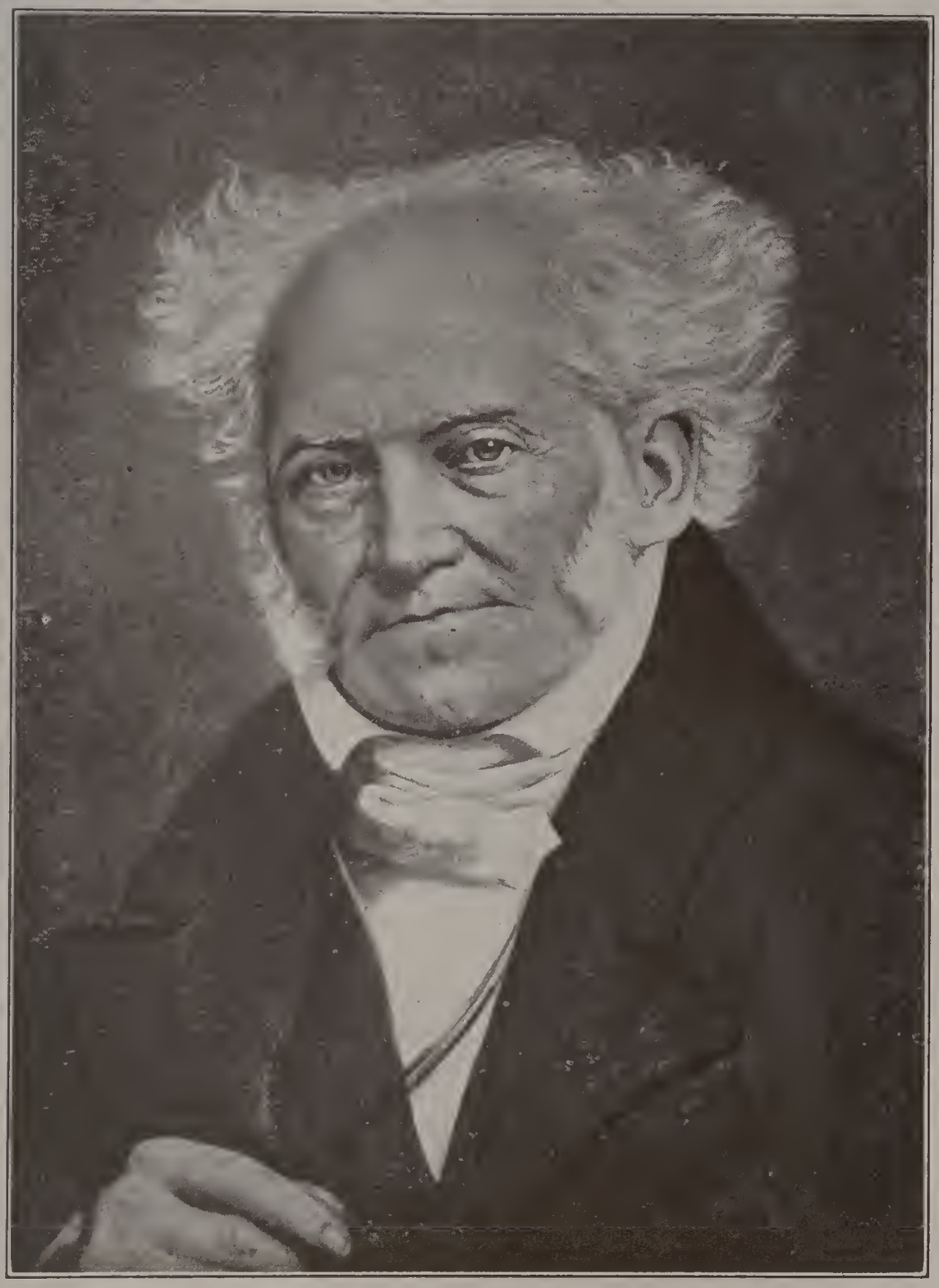
With the century of emancipation and its demand for new avocations and pursuits, the yeshibah began to decline in importance, although here and there in Poland, Moravia, Hungary, Russia, and Palestine it was much longer to retain its influence—good examples flourishing at Volozhin and Kovno in Russia, at Presburg in Hungary, with others in Jerusalem and in New York transplanted by Russian emigrants. In its place, however, the modern theological seminary is gradually winning its way, the most noted schools of this character being in Breslau, Berlin (2), Paris, Vienna, Budapest, London, and in New York and Cincinnati. The difficulty of combining modern and traditional requirements is undeniable, and to reconcile the scholastic methods of the Babylonian and Palestinian academies, which met such marked change and development in the Middle Ages, with the spirit and tendencies of the new era is a problem which demands solution and statesmanship of a high order. The schedule of studies at a rabbinical seminary like that of Breslau, for instance, includes chiefly the Talmud, Jewish history and philosophy, the ritual codes, Biblical exegesis, the rabbinical commentators; and it is expected of all regular students that they attend the university, where they select courses at will in history, philosophy, or philology, leading to the degree of Ph.D.

SCHOOLS, Regimental: schools maintained at military posts and all permanent camps for instruction in common branches of education. They are supported in both the British and the U. S. armies. There are schools not only for the men, but also for their children. In this country the children of privates must attend, but those of the officers, though permitted, are not required to be present. Teachers for all the schools connected with a regiment are chosen from the army, are subject to the orders of the commander of the post at which they are stationed, and receive 35 to 50 cents per day extra pay for their services in this direction.

SCHOOLS, Savings Banks in: a system of banks in connection with schools for receiving the savings of children, thus encouraging thrift. In nearly all European countries similar banks are maintained and the system has been established in several of the states in Australia, at Honolulu and in Canada, and was first founded in the United States in 1885 by J. H. Thiry, in the schools of Long Island City. The system has spread and is now in operation in more than 1,100 schools of over 100 cities of the United States and Canada. There have been nearly 180,000 depositors, whose savings have amounted to about $4,500,000.

SCHOONER, n. *skôn'ér* [Scot. *scon*, to make flat stones skip along the water: Dut. *schooner;* Ger. *schoner*, a schooner]; vessel, fore-and-aft rigged as regards her principal sails, with two or more masts; originally a swift-sailing, small type of vessel, but the rig has been adopted for very large vessels, and the old characteristics no longer specifically apply. There are two classes in general—the 'fore-and-aft schooner' and the 'topsail schooner.' Each of the masts, in both cases, consists of a lower and a top mast. In the 'fore-and-aft schooner' each lower mast carries a fore-and-aft sail, working on hoops upon the mast, and laced to a boom at bottom and gaff at top, above which is a triangular sail, generally working on hoops upon the topmast, and whose foot is stretched out to the outer end of the gaff. Each gaff and boom has a hollow at its forward end (the throat and jaws), or some equivalent device, to keep it against the mast. On diagonal stays, between the masts, a number of staysails may be set. From the bows a heavy spar or beam, called the bowsprit, projects, beyond which the flying jib-boom sometimes extends. Stays are carried from the foremast to the bowsprit and flying jib-boom, on which staysails, called jibs, generally are set. Minor variations in this rig obtain. Sometimes a lug sail is used upon the lower foremast, and lug topsails are also sometimes used. In this country, the first described simple fore-and-aft rig prevails. A large square sail is sometimes provided for the lower foremast.

The 'topsail schooner' carries two or three cross-yards upon her foretopmast, on which square topsail and topgallant sails are spread. In this country 'topsail schooners' are not often seen. They do not sail as close to the wind as 'fore-and-afters,' yet possess certain advantages at sea. The original schooner had two masts, the fore and main mast. Next, a third or mizzen mast was added, and now there are a number of four-masted schooners, as large as ships, fore-and-aft rigged throughout. Five-masted schooners have not been introduced to any extent. Schooners are easily managed by small crews. Four sailors, with captain, mate, and cook, will suffice for a schooner carrying three to five hundred tons. In the larger vessels a donkey-engine is often used to hoist sails and overhaul heavy tackle, as well as to discharge cargo. Sometimes auxiliary screw-propelling machinery is used to drive the vessel in calms and other situations. For such use the fore-and-aft schooner rig is peculiarly well suited, as the absence of cross-yards diminishes the resistance of the air when propelled by power. The rig is becoming a very favorite one in this country, and is supposed to be of American origin. The famous 'Baltimore clippers' of the beginning of this century were schooners.



ARTHUR SCHOPENHAUER.

SCHOPENHAUER, *shō'pen-how'er*, ARTHUR: German philosopher: 1788, Feb. 22—1860, Sep. 21; b. Danzig; son of Johanna S., authoress of considerable distinction (1770–1838). He studied first at Göttingen, where the lectures of Schulze inspired him with a love of philosophy, and afterward at Berlin and Jena, graduating at Jena 1813. During the same year, he published his first treatise, *Ueber die vierfache Wurzel des Satzes vom zureichenden Grunde* (Rudolst. 1813, 2d ed. Frankf. 1847), in which he lays down the logical basis of his future system. S. spent the winter of 1813 at Weimar, where he had the society of Goethe, and the orientalist Friedrich Maier, who first turned his attention to the ancient Indian literature and philosophy, whose study exercised decisive influence on his development. He then proceeded to Dresden, where he published a treatise on Sight and Color (1816); and three years later, his great work, *Die Welt als Wille und Vorstellung* (The World as Will and Idea, 1819; 5th ed. 1879; translated by Haldane and Kemp, 3 vols., 1883–86). After 1820 S. lived partly in Italy and partly in Berlin, till 1831, when he settled himself in Frankfort, laboring uninterruptedly in elaborating his system. The fruits of his studies were *Ueber den Willen in der Natur* (Frankf. 1836); *Ueber die Freiheit des Willens, Ueber das Fundament der Moral*, the supplements to his principal work, which appear in the 2d ed. of 1844; and *Parerga und Paralipomena* (Berl. 1851). The fundamental doctrine of S. is that the only essential reality in the universe is will; that what are called appearances exist only in our subjective representations, and are merely forms under which single original will shows itself. This will is not necessarily accompanied by self-consciousness, though it ever strives after its attainment; hence S. declared himself the uncompromising opponent of all the contemporary systems—those of Fichte, Schelling, and Hegel—in which the 'Absolute Reason,' 'Consciousness,' etc., are posited as the necessary basis of thought. For his great rivals, S. professed the most unmeasured scorn—calling Hegel, for example, a mere 'scribbler of nonsense'—and in return was treated by them with such contemptuous neglect that for years his name was almost unknown to the majority of German students.—S.'s philosophy is not original, being modelled on the ancient Asiatic type; but his utterance is from his heart, and therefore penetrating; and his masterly arrangement and lucid expression give him high literary rank. His ethics are based on a thoroughly pessimistic theory of life. He taught that all life is a ceaseless battle for existence, and is of the nature of a tragedy; that happiness does not exist except as a mere negation—the relief from pain; that man's great object should be to break down his will, quench all desires, and thus practically extinguish his self as a separate existence —thus effecting 'a re-implication' of his individuality into the absolute from which 'life' constitutes a separation. S. points man to a final goal which corresponds with the Nirvâna of the oriental mystic. He praises asceticism and

benevolence as steps of approach to this. Yet this advocate of asceticism was immoderate in his use of the enjoyments of life; and this preacher of benevolence withdrew from his mother, and never saw her during the last 24 years of her life, and, in an unfounded suspicion of his sister in relation to some property, ceased all correspondence with her for 14 years.—S. has of late had an evident influence on philosophical speculation. His cynical criticism, and the deep bitterness of his heart against the world's whole artificial life, give voice to that sense of unreality which arises in the human soul in the midst of an intellectual and æsthetic culture that rests and ends in visible things—counting as practically non-existent man's spiritual nature and his relations therein to his fellow-men and to the living God.—The literature of the subject is boundless; some of the chief writers on S. being Frauenstädt, Cornill, Asher, Seydell, Haym, and Hartmann; in French, Ribot.

SCHORL, or SHORL, n. *shawrl* [Ger. *schörl;* Sw. *skörl*, brittle]: a brittle mineral, occurring in black prismatic crystals, known also as black tourmaline (see TOURMALINE). SCHORLACEOUS, a. *shawr-lā shŭs*, or SCHORLY, *shawr'lĭ*, possessing the properties of shorl. SCHORL ROCK, granitoid rock, in which the mica is replaced by schorl or tourmaline. Some specimens occur in which the felspar also is absent, and the mass is composed entirely of quartz and schorl. Schorl rocks are rare, occurring probably only as small bosses in granite.

SCHOTTISH, or SCHOTTISCHE, *shŏt'tēsh* [from Ger. *schottisch*, Scottish]: fanciful name given to a slow modern dance in $\frac{2}{4}$ time.

SCHOULER, *skō'lĕr*, WILLIAM: 1814, Dec. 31—1872, Oct. 24; b. Scotland. In his infancy he was brought to New England. After studying in the public schools, he worked at printing calico; but later engaged in journalism and authorship. He owned and conducted the Lowell, Mass., *Courier* 1841–47; and was editorially connected with the *Daily Atlas*, Boston, 1847–53, the Cincinnati *Gazette* 1853–56, the *Ohio State Journal* 1856–58, and in the latter year became editor of the *Atlas and Bee*, of Boston. He served four terms in the Mass. house of representatives and one term in the Mass. senate; was a member of the state constitutional convention 1853, and adjt.gen. 1860–66. In 1857 he was adjt.gen. of Ohio. He published a *History of Massachusetts in the Civil War*, 2 vols. (1868–71). He died in W. Roxbury, Mass.—His son, JAMES S. (b. W. Cambridge, Mass., 1839), graduated at Harvard 1859; writer and lecturer on law: his *History of the United States under the Constitution* (5 vols.) had been issued as far as vol. IV. 1890.

SCHOUWEN, *skow'ĕn:* insular portion of the province of Zeeland (q v.). Pop. 20,000.

SCHREINER, *shrī'nĕr*, OLIVE (pen-name RALPH IRON): author: b. in Cape Colony, s. Africa, 1862: daughter of a German Lutheran missionary and granddaughter (mater-

nal side) of an English Congregational minister. She began writing short stories at an early age, and 1882 took the MS. of *The Story of an African Farm* to London, where George Meredith examined it and introduced her to the publisher who brought it out. Later works include: *Dreams* (1891); *Dream Life and Real Life* (1893); *Trooper Peter Halket of Mashonaland* (1897); etc.

SCHREVELIUS, *skrā-vā'lē-ŭs,* CORNELIUS: Dutch scholar: 1615-1664, Sept. 11; b. Haarlem. In 1642 he succeeded his father as rector of the University of Leyden. Schrevelius was a laborious and erudite man, but possessed little critical discernment. His most notable performance was *Lexicon Manuale Græco-Latinum et Latino-Græcum* (Leyden 1654, 57, 64), of which there have been innumerable editions. He executed many *variorum* editions of the classics—Juvenal (1648), Hesiod (1650), Terence (1651), Virgil (1652), Horace (1653), Homer (1656), Martial (1656), Lucan (1658), Cicero (1661), Ovid (1662), and Claudian (1665).

SCHREYER, *shrī'ėr,* ADOLPH: painter: b. Germany, 1828; d. 1899. He studied under good teachers at Munich and other cities; followed the Austrian army along the Danube 1854; and then traveled extensively in Russia and Turkey, Algeria, and the East; after which he settled at Paris. His landscapes are beautifully colored, and his animal portraits are widely celebrated. Among his famous pictures are *Horses Frightened by Wolves; The Wallachian Extra Post;* and *The Watering Place.*

SCHRIVER, *shrī'vėr,* EDMUND: soldier: b. York, Pa., 1812, Sept. 16; d. 1899. He graduated from West Point 1833, served in the Seminole war 1839, reached the rank of captain, resigned from the army 1846, became treasurer of the Rensselaer & Saratoga railroad 1847-61, was president of the road during the last ten years of that period, and was connected with other railroad corporations. On the opening of the civil war he re-entered the army; was aide-de-camp to Gov. Morgan of New York, and afterward chief staff-officer to Gen. McDowell and Gen. Frémont; was in the battles of Cedar Mountain, the second Bull Run, Chantilly, Chancellorsville, and Gettysburg, and in a large part of the Richmond campaign. He was at various times on special duty, and was inspector at West Point 1867-70. By promotion he reached the rank of colonel, was brevetted brigadier-general U. S. army 1864, and major-general U. S. army 1865, and retired 1881, Jan.

SCHROEDER, *shrö'dėr,* ANTOINETTE SOPHIE: actress: 1781, Feb. 28—1868, Feb. 25; b. Germany. At the age of 12 years she made her appearance on the stage at St. Petersburg, in which city both her parents were then acting. Two years later she was married to an actor named Stollmers, manager of another company, but she lived with him only a short time. For her second husband she

married 1804 Friedrich Schroeder, famous singer, who died 1818. She married 1825 an actor named Kunst. She appeared in the principal theatres of Germany; and in the impersonation of tragic characters, as Phædra and Lady Macbeth, she was one of the first actresses of her time. In 1840 she retired from the stage. She died at Munich.

SCHROON LAKE, *skrôn:* lake about 10 m. long, and nearly 2 m. wide, about equally divided by the boundary-line between Essex and Warren cos., N. Y.; 15 m. w. of Lake George.—The lake is an expansion of *Schroon river*, which rises in Essex co., near Dix's Peak, one of the Adirondacks, flows s., and expands into S. Lake. Issuing from it at the s. extremity, it takes a s.e. and then a s.w. course through Warren co., and empties into the Hudson near Thurman Station, about 7 m. n.w. of Caldwell.—*Scroon Lake village* is at the head of the lake, which is navigable for small steamboats. The village is a popular summer-resort.

SCHUBERT, *shō'bĕrt*, FRANZ PETER: German musical composer: 1797, Jan. 31—1828, Nov. 19; b. Vienna. He began to compose about the age of 12, and from that time he produced a series of works, increasing year by year in number and importance. His life was uneventful, but through all its short span he suffered almost continually from poverty and want of recognition. His life was a succession of disappointments. The few clothes and other possessions left at his death were officially valued at 63 Vienna florins (= about $12.16). Until long after his death, he was known almost solely by his songs; of which 457 are now published. But recent years have brought to light a vast store of his orchestral and chamber music, foremost among which stands his great symphony in C. His known works amount to over 1,000. His music is distinguished above all by its overflowing wealth of expressive melody, control over its exuberance being perhaps his only lack. It was the marvellous production of genius, not of learning. He seldom saw any of his compositions after he had finished them, and seldom heard them performed. His operatic works have probably owed their ill success mainly to the worthlessness of their *libretti*. His characteristics may be summed up in Liszt's words, 'the most poetical musician that ever was.'

SCHULTE, *shûl'tĕh*, JOHANN FRIEDRICH: born Westphalia, 1827, Apr. 23. He studied law, practiced at Berlin and other cities, became prof. of canon law at Prague 1855; and, on account of his strong opposition to the doctrine of papal infallibility, was called to a similar professorship at Bonn 1872. He is opposed to the enforced celibacy of priests, and is a prominent leader of the Old Catholic party. He has published several important works, including *Die Macht der römischen Päpste* (1871).

SCHULTZE, *shûl'tsĕh*, MAX JOHANN SIGISMUND: anatomist and microscopist: 1825, Mar. 25—1874, Jan. 16; b. Freiburg, Breisgau. He studied medicine at Greifswald and Berlin 1845–50; then was tutor at Greifswald till 1853.

when he travelled in Italy in the interest of zoological research. On his return to Germany, he published the result of his studies in a work *Ueber den Organismus der Polythalamien* (1854). He was appointed extraordinary prof. at Halle 1854, and ordinary prof. of anat. and histology at Bonn 1859. He published many monographs on the anatomy of the lower organisms. The doctrine of Protoplasm (q.v.) and the Cell-theory (q.v.) have been developed very largely through the researches of S.: he was the first to propound the modern accepted definition of the cell as 'a nucleated mass of protoplasm with or without a cell-wall.' He was also the first to recognize the identity of sarcode with the protoplasma of plants; he therefore classed them under the one name 'protoplasm.'

SCHULTZ'S TEST [after the discoverer]: a test for cellulose. It consists of a solution of chloride of zinc, iodide of potassium, and iodine, and colors cellulose, if present, blue.

SCHULZE-DELITZSCH, *shŭl'tséh-dā'lĭch*, HERMANN: economist: 1808, Aug. 29—1883, Apr. 29; b. Delitzsch, Saxony. He studied at Leipzig and Halle, practiced law, and was assistant judge at Berlin. He began the study of social problems about 1843, was elected to the national assembly at Berlin 1848, and was chairman of a committee of that body to inquire into the condition of the working people. He pointed out the evils of the guild system on the one hand, and of the 'state help' plans of the socialists on the other; and advocated the formation of co-operative associations which should enable small manufacturers to compete successfully with large companies and allow men of limited means to purchase the necessaries of life at wholesale prices. He founded co-operative stores, and banks, known as Credit Unions, which were very successful. Nearly 1,000 of the unions had been established in Germany previous to 1878, and many similar organizations were formed in Belgium and other countries. He became a member of the Prussian house of deputies 1861, and from 1874 till his death was in the reichstag. He published several works on the subject of co-operation and on political economy. He died at Potsdam.

SCHUMANN, *shō'mân*, ROBERT ALEXANDER: German musical composer: 1810, June 8—1856, July 29; b. Zwickau, in Saxony. His gift for music showed itself early. After studying law—at the wish of his mother—two years at the Univ. of Heidelberg, he turned to music, with ambition to excel as pianist; but the disablement of a finger compelled him to relinquish this aim. His efforts were then directed for a while almost exclusively to composition of pianoforte music, in which he originated a completely new style, reflecting his own dreamy imaginative nature, often showing genuine humor, and always thoroughly solid. About the time of his marriage, 1840, to Clara Wieck, one of the greatest living pianists, he produced a series of songs, remarkable for profound suggest-

iveness, which have taken lasting hold on the kindred minds of his countrymen. His piano concerto, and five symphonies, productions of later life, are generally considered the finest of their class since Beethoven's. He has produced also some choral works of the highest class, notably the cantata *Paradise and the Peri,* and settings of parts of Goethe's *Faust* and Byron's *Manfred.* Among his chamber music, his piano quintet claims the highest rank. 1834-44 Schumann was editor of the famous *Neue Zeitschrift für Musik,* originated principally by himself; and his critical contributions have a foremost place in the literature of art. Schumann died at Endenich, near Bonn. Since then his name has been the watchword of the *Romantic* school of music, in opposition to the *Ideal,* represented by Mendelssohn.

SCHURMAN, *shûr'man,* JACOB GOULD, PH.D., LL.D.: educator: b. Freetown, Prince Edward Island, Can., 1854, May 22. He won a government scholarship 1870 in the entrance examination at Prince of Wales College at Charlottetown; entered Acadia College, Nova Scotia, 1873; in 1875 won the Canadian Gilchrist scholarship in connection with the University of London, which is worth $500 a year for 3 years; graduated 1877 at the University of London with the university scholarship in philosophy, worth $250 a year for 3 years; and 1878 took the degree PH.D., and won the Hibbert traveling fellowship, open to all graduates of British universities, and worth $1,000 a year for 2 years. In 1880 he returned to Canada, where he was professor of English literature, political economy, and psychology, in Acadia College, for 2 years, and professor of metaphysics and English literature in Dalhousie College for 4 years. While studying in Berlin he became acquainted with Andrew D. White, ex-president of Cornell University, then U. S. minister to Germany; and as a result he was offered the chair of Sage professor of Christian ethics and mental philosophy in Cornell University, which he accepted 1886 and held till 1891, when he became dean of the Sage school of philosophy there. In 1892 he was unanimously elected president of the university, succeeding Charles Kendall Adams, D.D., LL.D., resigned. In 1892 he became editor of the *Philosophical Review,* and in 1893 of the *School Review.* In 1899 he was appointed chairman of a commission sent to study the conditions in the Philippines, and was joint author of the report (2 vols. 1900). His published works are *Kantian Ethics and the Ethics of Evolution* (1881); *The Ethical Import of Darwinism* (1888); *Belief in God* (1890); *Agnosticism and Religion* (1896); *A Generation of Cornell* (1898); *Philippine Affairs—A Retrospect and Outlook* (1902).

SCHURZ, *shûrts,* CARL, LL.D.: statesman: b. Liblar, Prussia, 1829, Mar. 2; d. N. Y. City, 1906, May 14. He was educated in the gymnasium at Cologne and at the University of Bonn; aided Prof. Gottfried Kinkel in

publishing a liberal newspaper; took part in an unsuccessful attempt to create a revolution at Bonn 1849; fled with Kinkel to the Palatinate, and was active in the revolutionary army in the defense at Rastadt; fled thence to Switzerland; and, returning to Germany 1850, aided Kinkel in escaping from the fortress of Spandau. In 1851-2 he was in Paris, corresponding with German newspapers and teaching. In 1852 he removed to the United States, spent three years in Philadelphia, and settled in Madison, Wis., 1855. He was active with pen and voice in the presidential campaign 1856, became leader of the German element in the new republican party, was defeated for lieutenant-governor 1857, began public speaking in English 1858, and began practicing law in Milwaukee 1859. In 1859-60 he delivered a series of public lectures in New England. He was conspicuous in the national republican convention and the presidential campaign 1860, and during a part of 1861 was U. S. minister to Spain, resigning to enter the army. In 1862, Apr., he was commissioned brigadier-general of volunteers. 1863, Mar. 14, was promoted major-general; and commanded a division in the second Bull Run and at Chancellorsville, and the 11th corps at Gettysburg; and took part at Chattanooga. Immediately after the war, he made a tour of the southern states under a commission by President Johnson. In 1866-68 he engaged in journalism in Detroit and St. Louis; 1869-75 was United States senator from Missouri; 1872 was president of the national liberal convention; 1875 settled in New York; 1876 supported the canvass of Gov. Hayes for president; 1877-81 was secretary of the interior department; 1881-83 was editor-in-chief of the *Evening Post;* and 1888-91 was American director of the Hamburg-American steamship line. He published a volume of speeches (Philadelphia 1865); a *Life of Henry Clay* (Boston 1887); and one of *Abraham Lincoln,* in the *American Statesmen Series* (Boston 1891). His autobiography was in course of publication at the time of his death. In 1884, 1888 and 1892 he supported Cleveland. He was identified with the Civil Service Reform League and the Anti-Imperialist League.

SCHUVALOFF, Peter Andreievitch, Count: Russian diplomat: b. Saint Petersburg, 1827, July 15; d. 1889, Mar. 22. He early entered the army, rose to the rank of general at 30, was head of a department in the ministry of the interior in 1862, governor of the Baltic provinces in 1864-6, and in the latter year was appointed chief of the secret service. He was sent to London in 1873 as special ambassador and arranged the marriage between the daughter of Alexander II., and the Duke of Edinburgh. In 1878 he was a representative at the Congress of Berlin, and later as ambassador to England he was instrumental in preserving friendly relations between Great Britain and Russia after the Russo-Turkish war of 1877-8.

SCHUYLER, *skī'lĕr*, EUGENE, LL.D.: diplomatist: 1840, Feb. 26—1890, July 18; b. Ithaca, N. Y.; son of George Washington S. He graduated from Yale College 1859, from the Columbia College Law School 1863, and practiced law in New York till 1866. He was U. S. consul at Moscow 1866–69, at Reval 1869–70, sec. of legation at St. Petersburg 1870–76, and while on leave of absence 1873 travelled extensively in Turkestan, Khokan, and Bokhara; was consul-gen. at Constantinople 1876–78, and investigated the massacres by the Turks in Bulgaria; was consul at Birmingham 1878–9; consul-gen. at Rome 1879–80, at Bucharest 1880–82, and in Greece, Servia, and Roumania 1882–84; engaged in literary work in the United States till 1889, when he became consul-gen. to Egypt, which office he held at his death. He was a member of various learned bodies and received decorations from several foreign governments. Among his books were: *Turkestan* (1876); *Peter the Great, Emperor of Russia* (2 vols. 1884); and *American Diplomacy and the Furtherance of Commerce* (1886). He died at Cairo, Egypt.

SCHUY'LER, PETER: 1657, Sep. 17—1724, Feb. 19 b. Albany, N. Y.; second son of Philip S., who emigrated from Amsterdam to Albany. S. began public life with appointment as lieut. of militia, and was promoted to col.; 1688, July, when Albany was incorporated as a city, he became its first mayor. In 1691 he commanded the force sent against the French and Indians, and 1709 was second in command of the expedition against Montreal. He had much influence with the Five Nations, conducted all their treaties, and was for many years chairman of the board of commissioners for Indian affairs. In 1692 he became a member of the council, and 1719 its pres., and in this capacity acting gov. until 1720, Sep., when Peter Burnet, the gov., arrived.—He died at Albany.

SCHUY'LER, PHILIP JOHN (usual signature PHILIP S.): soldier: 1733, Nov. 22—1804, Nov. 18; b. Albany, N. Y.; nephew of Peter S. He recruited a company, of which he was made capt., for the French and Indian war; was elected 1768 to the colonial assembly, and became a leader of the colonists in their disputes with the mother country; was a member of the continental congress at Philadelphia 1775, and was appointed maj.gen. in the army in June of that year. He organized troops; acted as quartermaster-gen., commissary-gen., and Indian commissioner; resigned 1776, Sep. 14, on account of the intrigues of Gen. Gates, but congress refused to accept his resignation; was re-elected to congress 1777, and was placed in command of the northern dept.; was superseded by Gen. Gates, who charged him with neglect of duty in allowing the capture of Ticonderoga, but he was fully exonerated by a court-martial; resigned his commission 1779 and served in congress till 1781. He was a member of the N. Y. state senate 1781–84, 1786–90, and 1792–97; was a senator in the national congress 1789–91 and 1797–8, resigning in the latter year on account of ill-health. He was one of the

leaders of the federalist party, was one of the first and strongest advocates of the N. Y. canal system, erected the first flax-mill in America, and aided in building Union College. He died at Albany. His *Life and Times*, by Benson J. Lossing, 2 vols., appeared 1860–62, enlarged ed. 1872.

SCHUYLKILL, *skōl'kĭl*, RIVER: rising 10 m. n.e. of Pottsville, in the carboniferous highlands of the e. centre of Penn., passing through the Kittatinny Mountain, and flowing in all 130 m. s.e., empties into the river Delaware at the s. limit of Philadelphia. It passes through Philadelphia, and is the chief water-supply of that city.

SCHWALBACH, *shwâl'bâch*, or LANG'ENSCHWAL'BACH, *lâng'ĕn-*: town in Hesse-Nassau, 12 m. n.w. from Wiesbaden. It lies in a deep valley, and is noted for its mineral springs, containing iron and impregnated with carbonic acid. It was a very popular watering-place as early as 1750; but declined greatly till 1866, when it was visited by the empress of France and the empress of Russia, and again became a fashionable resort.—Pop. about 2,800. The summer visitors number about 5,000.

SCHWANTHALER, *shwân'tâ-lĕr*, LUDWIG MYCHAEL: German sculptor: 1802, Aug. 26—1848; b. Munich; son of Franz S., also a sculptor. Young S entered his father's workshop at the age of 16; and on his father's death 1821, he undertook to carry on the business. His first important commissions were received 1824 from King Maximilian. After brief residence in Rome, he set up a studio at Munich, and shortly after executed for the *Glyptothek* there two fine bas-reliefs from Homer: *Achilles Struggling in the Scamander*, and the *Battle by the Ships*, besides a statue of Shakespeare for the saloon of the theatre, and the Bacchus-frieze for the banqueting-hall in the palace of Duke Maximilian. In 1832 he revisited Rome, to prepare models for that portion of the national monument of Valhalla intrusted to his supervision. He remained two years. On his return to Munich, he began his bas-reliefs to illustrate Pindar's *Epinikia* (Triumphal Odes) and the myth of Aphrodite—the latter a frieze. In 1835 he was appointed prof. at the Munich Acad. Thenceforth the interest of his career is mainly professional; but the number of his works is remarkably great for his comparatively short life: perhaps less productiveness might have made his undeniable excellence more uniform; still his place is in the first rank of German sculptors. His distinguishing characteristics are thorough originality of design and boldness of imagination; while the extraordinary extent of his acquaintance with the sculpture of Greece and of the middle ages gave great richness and variety to his execution of details. S.'s style has been designated as modern-antique, therefore characterized by conventionalism as opposed to the realistic. Among his works are 24 statuettes in the *Pinakothek* at Munich; the great bas-relief frieze (in the Barbarossa Hall), more than 200 ft. long; the models for the 12

statues of the Ancestors of the House of Wittelsbach, the 15 colossal statues for the front pediment of the Valhalla, the models of the 15 statues of the *Battle of Arminius* for the n. end of the same structure, and the model of the colossal statue of Bavaria, 54 ft. high; a marble statue of Emperor Rudolf for the cathedral of Spires, models for the statues of Goethe and Jean Paul Richter, a statue of Mozart, marble groups of Ceres and Proserpina (at Berlin), etc., besides many works by his pupils from his designs He died in Munich.

SCHWARTZ: see SCHWARZ.

SCHWARZ, *shwârts*, BERTHOLD: German alchemist and Franciscan monk: b., it is conjectured, at Freiburg, Breisgau (now a part of Baden), about the beginning of the 14th c. It is believed that his name was Constantin Aucklitzen, and that he was named Schwarz (black) in the monastery at Mentz, because of his liking for the study of the black arts. He is said to have invented gunpowder while in prison on the charge of sorcery about 1330; but as gunpowder was known before this date, he may have made some practical application of his knowledge of it about this time. In 1853 a monument was erected to him at his supposed birthplace, Freiburg.

SCHWARZ, CHRISTIAN FRIEDRICH: German Prot. missionary: 1726, Oct. 8—1798, Feb. 13; b. Sonnenburg, in Brandenburg. He studied at Halle; and having resolved to become a missionary in the E. Indies, obtained ordination at Copenhagen 1749, with the view of joining the Danish mission at Tranquebar, where he arrived 1750, having meanwhile sojourned in England to acquire the language. He had previously learned Tamil. His career is a beautiful example of what may be accomplished by a union of piety, integrity, good sense, and charity. After laboring 15 years at Tranquebar, he went to Trichinopoly, where he founded a church and school, and acted as chaplain to the garrison. Here the fruits of his long and consistent career of pious activity gradually began to show themselves in considerable conversions from Hinduism. In 1777 another missionary was sent to his assistance, and by the permission of the rajah of Tanjore, whose close friendship S. had acquired, he built a church in that city. So highly did the native rulers admire his integrity, that once, when Hyder Ali, of Mysore, was arranging terms of peace with the Madras govt., he demanded that S. should act as their agent—'him, and no other one,' said the sultan, 'will I receive and trust.' On this occasion, S. resided three months at Seringapatam. During the terrible Carnatic war which soon followed (1781–83), and for which S. thought the British were blamable, a striking testimony was given of the universal respect for his character. The inhabitants and garrison of Tanjore were dying of starvation, and neither the British nor the rajah could induce the cultivators to sell them provisions. In despair, S. was appealed to, and when he gave his word that payment should be made, the farmers believed him,

and sent the requisite supplies. On the death of the rajah of Tanjore 1787, S. was appointed tutor and guardian of his young son, Maha Sarboji, who, under S.'s care, developed into one of the most accomplished sovereigns in or out of India.

SCHWARZBURG, *shwârts'bûrch*, HOUSE OF: one of the oldest German families, founded about the middle of the 12th c., by Sizzo, Count of Schwarzburg and Käsernburg. The two sons of Sizzo were Heinrich, who succeeded his father as Count of Schwarzburg, and Günther, who became Count of Käsernburg. The former, dying childless 1184, his possessions went to his brother, who left two sons, Günther, who continued the family of the Counts of Käsernburg, and Heinrich, from whom sprang the Counts of Schwarzburg. In 1349 Günther XXI., younger son of Heinrich XII., was elected Emperor of Germany, but he died within the year of his election. Count Günther XL. of Schwarzburg and Arnstadt, who introduced (1541) the Reformation into his states, was the common ancestor of the two existing lines of the Schwarzburg family; his son Johann Günther founding the line of Schwarzburg-Sondershausen (q.v.), and his son Albert that of Schwarzburg-Rudolstadt (q.v.).

SCHWARZ'BURG-RUDOLSTADT, *-rō'dōl-stât:* Thuringian principality in the German empire; bounded c. by Weimar, Altenburg, and Meiningen, with a detached part, 30 m. n., in Prussian Saxony; 367 sq. m. It consists of the Upper Lordship (*Rudolstadt*, 282 sq. m.) and the Lower Lordship (*Frankenhausen*, 85 sq. m.). The Schwarza, Ilm, and Saale water the surface, mostly covered with spurs of the Thüringer-wald. The ordinary crops are raised, and timber, salt, and metals are the principal products. The principality contains many spots distinguished for beautiful scenery; and the vale of the Schwarza, the convent-ruins of Paulenzelle, and the remains of the castle of Kyffhausen, attract many visitors. S. has a diet of 16 members, of whom 12 are chosen by general election. S. has one vote in the federal council, and one in the diet.—Pop. (1880) 80,296; of whom more than 76,000 were Lutherans; (1890) 85,863; (1900) 93,059.

SCHWARZ'BURG-SONDERSHAUSEN, *-sōn'dêrss-how'zên:* Thuringian principality in the German empire; partly surrounded by Prussian Saxony; 333 sq. m. It consists of a Lower Lordship (*Sondershausen*) and an Upper Lordship (*Arnstadt*): the former, watered by the Helbe and Wipper, is fertile and agricultural; while the latter is mountainous, the seat of active manufactures. The diet contains 5 members nominated by the prince, 5 chosen by the most heavily taxed, and 5 by general election. S.-S. has one voice in the federal council, and sends one representative to the imperial diet.—Pop. (1880) 71,107, mostly Prot.; (1890) 75,510; (1900) 80,898.

SCHWARZENBERG, *shwâr'tsĕn-bĕrch:* princely family of Germany, dating from 1420, when *Erkinger von Seinsheim* purchased the lordship of S. in Franconia, and was raised (1429) by Emperor Sigismund to the dignity of Baron of the Empire. Two of this family have acquired European reputation: first, ADAM, Count of S. (1587–1641), prime-minister and adviser of Georg-Wilhelm, Elector of Brandenburg. He was all-powerful during the Thirty Years' War, and brought down terrible calamities on Brandenburg by his obstinate adherence to the alliance with Austria against the Prot. league, for which he was punished after the accession of the 'Great Elector,' 1640, by being despoiled of his power, and imprisoned in the fortress of Spandau, where he died.—For the other most distinguished member of this family, see SCHWARZENBERG, KARL PHILIPP.

SCHWARZENBERG, *shwâr'tsĕn-bĕrch,* FRIEDRICH JOHANN JOSEPH CELESTINUS VON: 1809, Apr. 6—1885, Mar. 2; b. Vienna; descended from a noble German family. He studied law, but afterward entered the Rom. Cath. priesthood, and was rapidly advanced. When only 27 years of age he became abp. of Salzburg, 6 years afterward a cardinal, and at the age of 41 abp. of Prague. On the ground of its inexpediency, he opposed the promulgation of the doctrine of the infallibility of the pope, but afterward accepted the decision of the council that it should be received; and in the Austrian house of lords he opposed the reform of the school laws.

SCHWAR'ZENBERG, KARL PHILIPP, Prince of: Austrian field-marshal: 1771, Apr. 15—1820, Oct. 15; b. Vienna. He served first against the Turks, and had risen to the grade of lieut. field-marshal 1799, at which date he raised a regiment of uhlans at his own cost. He was under the orders of Mack in the campaign of 1805, and commanded a division at Ulm; but when he saw that the battle was lost, he cut his way through the French army, and retired with his regiments to Eger, afterward taking part in the great battle of Austerlitz. He was ambassador at the Russian court 1808, by the express wish of the emperor Alexander; fought at Wagram 1809; and after the treaty of Vienna, conducted the negotiations preliminary to the matrimonial connection of Napoleon with the Hapsburg family; and both in this capacity and as ambassador at Paris, so gained the esteem of Napoleon that the latter expressly demanded for him the post of gen.-in-chief of the Austrian contingent of 30,000 men which had been sent to aid France against Russia 1812. S. with his little army entered Russia from Galicia, passed the Bug, and achieved some slight successes, but was afterward driven into the 'duchy of Warsaw' (see POLAND), and took up a position at Pultusk, where he concluded with the Russians an armistice which secured the French retreat. S. was much blamed for his dilatory conduct at the time; and his tardiness, ascribed by the French historians to secret instructions from his own govt., has since been much animad-

verted on by them; but nevertheless Napoleon concealed any dissatisfaction he might have felt, and demanded (1813) for him from the Austrian govt. the baton of field-marshal. After brief sojourn at Paris, S. was appointed to command the Austrian army of observation in Bohemia; and when Austria joined the allied powers, he became generalissimo of the armies of the coalition; gained the victory of Leipzig (q.v.), and introduced a cautious system of tactics, which insured a progressive hemming-in of the French, and, in spite of their occasional successes, completely wore them out. On the return of Napoleon from Elba, S. obtained the command of the allied army on the Upper Rhine, and a second time entered France. On his return to Vienna, he was made pres. of the imperial council for war, received an extensive grant of lands in Hungary, and was allowed to engrave the imperial arms of Austria on his escutcheon. He died of paralysis at Leipzig.—His nephew, FELIX LUDWIG JOHANN FRIEDRICH, Prince of S. (1800–52), distinguished himself in the Italian campaign of 1848, was placed at the head of affairs at Vienna, called in the aid of the Russians against Hungary, and pursued a bold policy in Germany. He died at Vienna.

SCHWARZ'WALD: see BLACK FOREST.

SCHWEDT, *shwĕt:* handsome town of Prussia, province of Brandenburg, on the Oder, 31 m. s.s.w. of Stettin. Weaving, brewing, manufacture of soap, and of tobacco, here extensively grown and sold, are principal industries. Pop. 9,800.

SCHWEGLER, *shwā'glĕr*, ALBERT: German historian and theologian: 1819, Feb. 10—1857, Jan. 5; b. Michelbach, Würtemberg. He studied at the Univ. of Tübingen (1836–40) and became a disciple of Dr. Baur and the Tübingen school in theology and criticism. In 1842 he was parish vicar at Bebenhausen, but resigned the charge 1843, and became *privat-docent* of philos. and classical philol. at Tübingen, and 1848 was appointed prof. of Roman literature and antiquities there, and later of anc. history.—S. asserts that early Christianity was doctrinally Ebionism; and creates for the early church a history according to this hypothesis. His best-known works are: *Der Montanismus* (1841); *Das Nachapostolische Zeitalter* (1846); *Geschichte der Philosophie* (1848, 11th ed. 1882); *Römische Geschichte* (1853); and *Geschichte der griechischen Philosophie*, published 1859, after his death at Tübingen.

SCHWEIDNITZ, *shwīd'nĭts:* charmingly situated town of Prussian Silesia, on the left bank of the Weistritz, 42 m. s.e. of Liegnitz, about the same distance s.w. of Breslau by railway. Woolen goods, leather, and agricultural implements are manufactured; and the fairs for corn, cattle, and yarn are much frequented. S. was besieged and taken four times within 50 years, the last time by the French 1807, when the defenses were mostly destroyed. Pop. 28,450.

SCHWEINFURT, *shwīn'fûrt:* ancient, and long an imperial free city, *Trajectus Suevorum* of the Romans, now a town of Bavaria, in Lower Franconia, on the Main, 29 m. n.e. of Wurzburg by railway. It contains a beautiful market-place, in which important cattle and wool markets are held. Wine-culture, sugar-refining, and manufactures of chemicals and dyeing materials, as white-lead, ultramarine, Schweinfurth green, etc., are carried on. Pop. 15,300.

SCHWEINFURTH, *shwīn'fûrt,* Georg August: African traveler: b. Riga, Russia, 1836, Sept. 29. He studied at Heidelberg, Munich, and Berlin, making botany his specialty. In 1864 he made a journey through the valley of the Nile and along the coasts of the Red Sea; and on his return to Berlin in 1866, had the botanical, zoological, and geological fruits of his travels classified. In 1868, by aid of a grant from the Royal Academy of Sciences of Berlin, he made his way, with the ivory-traders, from Khartoum into the interior, along the valley of the White Nile. Between the 4th and 6th parallels of n. lat. he penetrated as far w. as the 26th meridian, carefully observing the countries and the various tribes. He returned 1872; and 1874 published *Im Herzen von Afrika,* 2 vols.: an English translation, *The Heart of Africa,* was published the same year. He also investigated the oasis of El-Chargeh; the botany of Egypt; the southern portion of Arabia, and Hèlouan and Erythrea.

SCHWEINITZ, *shwī'nĭts,* Edmund Alexander von, D.D.: 1825, Mar. 20—1887, Dec. 18; b. Bethlehem, Pa.; great-great-grandson of Count Zinzendorf. He graduated from the Moravian theological seminary at Bethlehem 1844; studied at the University of Berlin; was settled as Moravian pastor at Canal Dover, O., 1850; and was afterward pastor in Pennsylvania, at Lebanon, Philadelphia, and Lititz, and at Bethlehem 1864-80. He was for a long period president of the theological seminary at Bethlehem, and of the Northern conference of the Moravian Church in this country; and was elected bishop 1870. He was held in high esteem beyond the bounds of his denomination. He published *The Moravian Manual* (1859); *The History of the Unitas Fratrum* (1885); and other works. He died at Bethlehem.

SCHWEINITZ, Emil Alexander de: American bacteriologist: b. Salem, N. C., 1866, Jan. 18; d. Washington, D. C., 1904, Feb. 15. He was graduated from the University of North Carolina in 1882, subsequently studying at Göttingen and taking a medical degree at Columbian University, Washington. He was dean and professor at the Columbian Medical School and director of the biochemic laboratory of the Department of Agriculture at Washington, and made many original investigations in regard to bacteria, tuberculosis, disinfectants and hygienic problems. The results of these investigations appeared in numerous published scientific papers.

SCHWEINITZ, *shwī'nĭts*, LEWIS DAVID VON, PH. D.: botanist: 1780, Feb. 13—1834, Feb. 8; b. Bethlehem, Penn. He was educated in the Moravian schools in this country and in Germany, remained abroad 14 years; returned 1812, was a pastor in Salem, N. C., and while there was elected pres. of the Univ. of North Carolina, but declined because he preferred church work; and was settled in Bethlehem 1821. He discovered more than 1,200 species of fungi and about 200 species of other plants, most of which were little known; and catalogued a great number of plants collected in the n.w. by Thomas Say. He published several catalogues and valuable botanical monographs. He died at Bethlehem.

SCHWENKFELD, *shwĕnk'fĕlt*, KASPAR VON: Protestant mystic: 1490–1561, Dec. 10; b. Silesia. He was descended from a noble family, was educated at the Univ. of Cologne, and after serving at smaller courts connected himself with the Duke of Liegnitz. He accepted the principles of the Reformation, and for a time was active in their promulgation, but afterward diverged therefrom, and incurred censure from both Rom. Catholics and Protestants. After leaving Liegnitz, he lived 5 years in Strasburg, and afterward in other cities. On account of religious perseeution he could not remain long in a place. He published the *Grosse Confession*, and other books. He died at Ulm. SCHWENK'FELDIANS, or SCHWENK'FELDERS; religious sect; organised by Schwenkfeld and known among themselves as 'Confessors of the Glory of Christ.' At the death of the founder there were members in all parts of Germany. To escape the persecution of the Jesuits, many of them came to Penn. 1734. They place little stress on sacraments and ordinances, believe in the intimate and inseparable union of the human and the divine in Christ, that Christ became completely deified and glorified only by his ascension, and they place their faith in a fellowship with Christ in his deified state more fully than in atonement through his death. They make a distinction between the Scriptures, which they regard as the outward word of God and as liable to pass away, and the Spirit, which they regard as the inward word and which they believe will be eternal. They hold somewhat peculiar views regarding church membership and discipline. There are about 1,000 Schwenkfeldians in Penn. They have houses of worship, ministers, and several schools.

SCHWERIN, *shwĕr'ĭn:* city, cap. of the grand duchy of Mecklenburg-Schwerin; agreeably situated 110 m. n.w. of Berlin; on the w. shore of the Schweriner See, a lake 14 m. long, 3 m. broad, abounding in fish. S. is divided into the old town, the new town, and the suburb; has many fine buildings, of which most conspicuous is the ducal palace, built 1844–57, with many towers (highest 236 ft.). S. contains one of the finest Gothic cathedrals in n. Germany, begun 1248, and finished in the 15th c. The ducal castle, erected by Wallenstein, is on a small island. In S. there are tobacco-factories, an iron-foundry, breweries, etc. Pop. (1890) 33,730; (1900) 38,672.

SCHWYZ, *shwīts:* one of the mountain cantons in the middle of Switzerland; bounded n. by the canton of St. Gall and the canton and Lake of Zürich. s. by the canton of Uri and the Lake of Lucerne; 350 sq. m.; pop. (1900) 55,385, of whom less than 1,000 were Protestants. The whole surface is covered with mountains, except small tracts in the s.w. and n.e.; but there are no glaciers, nor any perpetual snow except on the Rieselstock, 8,890 ft. high, on the e. frontier. The canton comprises a third part of Lake Zug, the most n. angle of the Lake of the Four Cantons, the whole of the mountain-mass of the Righi (q.v.), the plain in which lies the small Lake Lowerz, and the valleys of the Muotta, Sihl, and Aa, principal rivers. Cattle-breeding is the employment of almost all the inhabitants, and the number of cattle is estimated at about 20,000. Only about one-thirtieth of the whole area is cultivable; fruits and wine are produced to some extent; also cattle, cheese, and timber for export. Woven fabrics for home use are almost the only manufactures.

S., one of the three original cantons, also one of the Four Forest Cantons, has supplied the name to the whole country of which it forms a part. The govt. is a representative democracy.—SCHWYZ, the cap., is a small town (pop. 6,543), most picturesquely situated 17 m. e. of Lucerne. It has a beautiful parish church.

SCIACCA, *shâk'kâ* (anc. *Thermæ Seluntinæ*): seaport on the s. coast of Sicily, province of Girgenti; 37 m. w.n.w. of the city of Girgenti. It is defended by the castle of Luna, is surrounded by old walls, and has a fine cathedral founded 1090. Outside the walls are the hot springs visited by invalids; and on a neighboring height, the so-called *Stufe di St. Calogero.* At the bottom of one of the wells a noise is heard resembling that of a cascade. —Pop. 23,000.

SCIÆNIDÆ, *sī-ē'nĭ-dē:* family of acanthopterous fishes, somewhat resembling perches; having a compressed body; a simple or double dorsal fin, the first part spiny; gill-covers variously armed; head generally inflated, and

Sciæna aquila (Maigre).

its bones cavernous; scales ctenoid, in general obliquely ranged. The S. are divided into many genera, and widely distributed. Most are marine, but a few inhabit fresh water. Two species, the Maigre (q.v.) and the Bearded Umbrina, are excellent for the table. The power of emitting sounds which belongs to the maigre is possessed also by others of the family in a remarkable degree. Among these are species of *Pogonias* (q.v.), as *P. chromis,* known by the name DRUM-FISH, because the sound which it emits resembles that of a drum.

SCIAGRAPH, n. *sī'ă-grăf* [Gr. *skia,* a shadow; *graphō,* I write or describe]: in *arch.*, the profile or section of a building to exhibit its interior structure. SCIAGRAPHY, n. *sī-ăg'ră-fĭ,* or SCIOGRAPHY, art of sketching and delineating shadows as they fall in nature; art of delineating buildings on a vertical plane (see SECTION). SCI'AGRAPH'ICAL, n. *-ĭ-kăl,* pertaining to sciagraphy. SCI'AGRAPH'ICALLY, ad. *-lĭ.*

SCIATICA, n. *sī-ăt'ĭ-kă* [mid. L. *sciat'ĭcă,* sciatica—corrupted from L. *ischĭadĭcus,* subject to pain in the hips—from Gr. *is'chĭas,* a pain in the hips—from *is'chĭŏn,* the hip-joint: F. *sciatique*]: rheumatism of the hip; hip-gout. SCIAT'IC, a. *-ĭk,* or SCIAT'ICAL, a. *-ĭ-kăl,* pert. to rheumatic affections of the hip. SCIAT'ICALLY, ad. *-lĭ.*—*Sciatica* is properly neuralgia of the great sciatic nerve. See NERVOUS SYSTEM. It is characterized by irregular pains about the hip, especially between the great trochanter of the thigh-bone and the bony process on which the body rests when sitting, spreading into neighboring parts, and running down the back of the thigh to the leg and foot; or the pains may occupy only isolated parts, as the knee-joint, the calf of the leg, or the sole of the foot. Sciatica is a very obstinate disease, but the treatment is the same as that of neuralgia generally, except when it is merely a complication of gout, in which case the primary disease must be attacked as well.

SCIATIC STAY, *sī-ăt'ĭk* [possibly a corruption of *Asiatic*]: in merchant-vessels, strong rope fastened between the main and foremast heads. When loading or unloading, a traveling tackle is suspended to it, which can be brought over the fore or main hatchway as occasion demands.

SCICLI, *shĭk'lē:* town of Sicily, province of Syracuse, on the small river Scicli, 21 m. w.s.w. from Noto. Woolen manufacture is carried on. Scicli is supposed to be the ancient *Casmenæ.* Pop. 10,029.

SCIDMORE, *skĭd'mōr,* ELIZA RUHAMAH: American traveler and author; b. Madison, Wis., 1856, Oct. 14. Her published works are: *Alaska: The Southern Coast and the Sitkan Archipelago* (1885); *Westward to the Far East; From East to West; Guide to Alaska* (1890-8); *Java: the Garden of the East* (1897); *Winter India* (1903); etc.

SCIENCE, n. *sī'ĕns* [F. *science*—from L. *scĭen'tĭa,* knowledge, science—from *sciō,* I know: It. *scienzia*]: acknowledged truths and laws, in any department of mind or matter, digested and arranged into a system; profound or complete knowledge (see SCIENCES). SCIENTIFIC, n. *sī'ĕn-tĭf'ĭk,* or SCI'ENTIF'ICAL, a. *-ĭ-kăl* [L. *scientĭa,* knowledge; *facĭō,* I make]: according to science; producing or containing certain knowledge. SCIENTIF'ICALLY, ad. *-lĭ.* SCI'ENTIST, n. *-tĭst,* one versed in science; a savant—a term which originated in the United States.

ABSTRACT, PURE, or THEORETICAL SCIENCES are regarded as six in number, viz., 'mathematics, physics, chemistry, biology, psychology, sociology,' and treat of the knowledge of powers, causes, or laws considered apart from all applications; the knowledge of reasons and their conclusions. CONCRETE, DERIVED, or APPLIED SCIENCES apply the knowledge of the powers treated of to concrete phenomena, and are such as 'meteorology, mineralogy, botany, zoology, geology, geography, and in a limited sense astronomy;' the application of scientifically obtained facts and laws to some practical end, as in 'navigation, engineering, mining, medicine,' etc. (See SCIENCES). INDUCTIVE SCIENCE, the process of scientific investigation which establishes a general law by actual observation of known facts and repeated experiments. NATURAL SCIENCE, the knowledge of causes and effects, and of the laws of nature. THE SEVEN SCIENCES, among *anc. authors*, these were grammar, logic, rhetoric, arithmetic, geometry, astronomy, and music.—SYN. of 'science': literature; art; knowledge; erudition; letters.

SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF: society for promoting the object indicated in its title, by holding in different cities assemblies of its members for public addresses and the reading of papers on topics connected with the natural sciences, and by publishing the same; also by aiding the prosecution of original scientific research. The 'Amer. Assoc.,' or A. A. A. S., was organized under its present name 1847, having already existed 27 years as an association of American geologists and naturalists which, like the American Association, held its annual meetings in different cities of the Atlantic states. The constitution of the new organization was adopted at Philadelphia 1848, and the association was incorporated by the Massachusetts legislature 1874. In the *Proceedings*, published annually in one volume, all the papers, essays, and memoirs presented to the annual meetings are printed. See SCIENCE, NATIONAL ACADEMY OF.

SCIENCE, CHRISTIAN. See CHRISTIAN SCIENCE.

SCI'ENCE, SO'CIAL. See SOCIAL SCIENCE.

SCIENCES, NATIONAL ACADEMY OF: institution incorporated by act of Congress 1863; having as one of its purposes to make available to the government the knowledge of scientific specialists and experts. The membership was at first limited to 50 members, 50 foreign associates, and an indefinite number of honorary members; but the restriction no longer exists. There are two 'classes' in the Academy: 1, mathematics and physics; 2, natural history. It holds two meetings a year, one in Jan. (at Washington), the other in Aug. (at a city designated by the Academy). The academy's publications are styled *Memoirs*.—See SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF.

SCIENCES: various departments of human knowledge, so far as it has been generalized, systematized, and verified. Generality as opposed to mere particulars, system as opposed to random arrangement, and verification as opposed to looseness of assumption or mere theorizing, concur in that superior kind of knowledge dignified by the title Science. Geography, Chemistry, and Political Economy are now sciences. The first has been so for many ages, though greatly advanced in recent times; the second, scarcely more than a century; the last is still more recent. Chemical facts, and maxims of political economy, had been known from a much earlier date, but they did not in either case amount to science; the generalities were few or bad, system and certainty were both lacking. In the different branches of Nat. History—Mineralogy, Botany, Zoology—there had been a large store of accumulated facts before any one branch could be called a science The *quality* of the knowledge is of more consequence than the quantity.

The term *Philosophy* (q.v.,) is to some extent, but not altogether, coincident with science, being applied also to the early efforts and strainings after the explanation of the universe, that preceded exact science in any department. Both names denote the pursuit of knowledge as knowledge, or for intellectual satisfaction, in contrast to a search limited to immediate practice or utility.

The S. have been variously classified, and the principles of their classification have been a subject of discussion. We shall here describe the mode of classifying them in accordance with present usage, and with the principles most generally agreed upon. It is convenient to prepare the way by distinguishing between Theoretical S., which are the S. properly so-called, and Practical S. A Theoretical Science embraces a distinct department of Nature, and is so arranged as to give, in the most compact form, the entire body of ascertained (scientific) knowledge in that department: such are Mathematics, Chemistry, Physiology, Zoology. A Practical Science is the application of scientifically obtained facts and laws in one or more departments to some practical *end*, which end rules the selection and arrangement of the whole; e.g., Navigation, Engineering, Mining, Medicine. Navigation selects from the Theoretical S.—Mathematics, Astronomy, Optics, Meteorology, etc.—whatever is available for guiding a ship on the seas, and converts the knowledge into rules or prescriptions for that purpose. The arts that can thus draw on the exact S. are by so much the more certain in their operation; they are the scientific arts.

Another distinction must be made before laying down the systematic order of the Theoretical S. A certain number of these S. have for their subject-matter each a separate department of natural forces or powers; thus, Biology deals with the department of Organized Beings, Psychology with Mind. Others deal with the application of powers elsewhere recognized to some region of concrete facts or phenomena: thus, Geology does not discuss any natural

powers not found in other S., but seeks to apply the laws of Physics, Chemistry, and Biology to account for the appearances of the earth's crust. The S. that embrace peculiar natural powers are called Abstract, General, or Fundamental S.; those that apply the powers treated of under these to regions of concrete phenomena are called Concrete, Derived, or Applied Sciences.

The Abstract or Theoretical S., as most commonly recognized, are these six: Mathematics, Physics, Chemistry, Biology (Vegetable and Animal Physiology), Psychology (mind), Sociology (society). The Concrete S. are the Natural History group—Meteorology, Mineralogy, Botany, Zoology, Geology, also Geography, and we might, with some explanations, add Astronomy. The Abstract or Fundamental S. have a definite sequence, determining the proper order for the learner, also the order of their arriving at perfection. We proceed from the simple to the complex, from the independent to the dependent. Thus, MATHEMATICS relates to *Quantity*, the most pervading, simple, fundamental, and independent attribute of the universe. The consideration of this attribute has therefore a natural priority; its laws underlie all other laws. As Mathematics is at present understood, it has an Abstract department, which treats of quantity in its most general form, or as applied to nothing in particular—including Arithmetic, Algebra, and the Calculus—and a Concrete or Applied department—viz., *Geometry*, or Quantity in Space or Extension. It has been suggested that General Mechanics, or the estimation of Quantity in *Force*, should be considered a second Concrete department. But usually Mechanics ranks with the next Fundamental Science in order, called Physics.

NATURAL PHILOSOPHY has long been the name of a distinct department of science: the designation PHYSICS is now more common. This science succeeds Mathematics, and precedes Chemistry. Of all the Fundamental S., it has the least unity, being an aggregate of subjects with more or less connection. Mechanics, Hydrostatics, Hydraulics, Pneumatics, Acoustics, Astronomy, all are closely related; they represent the phenomenon of movement in *mass*, as applied to all the three states of matter, Solid, Liquid, and Gas. The remaining subjects—Heat, Light, and Electricity—together with the attractions and repulsions that determine Cohesion, Crystallization, etc., are described as relating to movement in the *molecule*. We have thus Molar Physics and Molecular Physics; and the tendency is now to treat the two separately.

CHEMISTRY lies between Physics and Biology, reposing upon the one and supporting the other. It assumes all the physical laws, both molar and molecular, as known, and proceeds to consider the special phenomenon of the composition and decomposition of bodies considered as taking place in definite proportions, and leading to change of properties. The composition of a cup of tea from water, sugar, milk, and infusion of tea-leaf, is physical; the composition of marble from oxygen, carbon, and calcium, is chemical. In the first case, the properties of the separate

ingredients are still discernible: in the other, these are merged and untraceable.

BIOLOGY, or the Science of Living Organization, involves mathematical, physical, and chemical laws, in company with certain others, called vital. It is usually expounded under the designations Vegetable and Animal Physiology; and in the Concrete departments, Botany, Zoology, and Anthropology.

PSYCHOLOGY, or the Science of MIND, makes a wide transition, the widest that can be taken within the whole circle of the S., from the so-called material world, to the world of Feeling, Volition, and Intellect. The main source of our knowledge of mind is self-consciousness; and it is only from the intimate connection of mind with a living organism that the subject is a proper sequel to Biology. Not until lately has any insight into mind been obtained through consideration of the physical organ—the brain; so that Psychology might have been placed anywhere, but for another consideration that helps to determine the order of the S.—viz., that the *discipline*, or method, of the simpler S. is a preparation for the more abstruse. Mathematics and Physics especially train the intellect for the studies connected with mind proper, though the laws of Physics may not of themselves throw any direct light on the successions of thought and feeling.

These five S. embrace all the fundamental laws of the world, and, if perfect, their application would suffice to account for the whole course of nature. To a person fully versed in them, no phenomenon of the explained universe can appear strange; the Concrete S. and the Practical S. contain nothing fundamentally new. They constitute a liberal scientific education. It is not uncommon, however, to rank SOCIOLOGY, or the Laws of Man in Society, as a sixth primary science following on Psychology, of which it is a special development.

Dr. Neil Arnott, in his work on *Physics* (1828), gave as the primary departments of Nature—Physics, Chemistry, Life, and Mind (under which he would include the Laws of Society). He did not discard Mathematics, but regarded it as a system of technical mensuration, created by the mind to facilitate the study of the other sciences, as well as of the useful arts. The natural laws expressed by Mathematics are few and simple; and the body of the science consists of a vast scheme of numerical computation, whose value appears in its applications to Astronomy and the other physical sciences.

Auguste Comte, who, in his *Cours de Philosophie Positive*, went over the entire circle of the Theoretical, Abstract, or Fundamental S., enumerated these as follows: Mathematics, Astronomy, Physics, Chemistry, Biology, Sociology. He thus detaches Astronomy from Physics, considering it as the abstract science that brings forward and works out the Law of Gravitation. He has no distinct science of Psychology—an omission generally condemned: see POSITIVISM.

Herbert Spencer, in a tract on the *Classification of the*

Sciences takes exception to the scheme of Comte, and proposes a threefold division, according to the gradations of Concreteness in the subject-matter. The first group is termed ABSTRACT SCIENCE, and treats of the *forms* of phenomena detached from their embodiments. The most comprehensive forms are Space and Time; and the sciences corresponding are Mathematics and Logic. The second group is ABSTRACT-CONCRETE SCIENCE, or the phenomena of nature analyzed into their separate elements—Gravity in the abstract, Heat in the abstract—as in Physics and Chemistry. These are two of the Fundamental S. in every scheme, and they are called Abstract-Concrete by Spencer, in comparison with the foregoing class. The great principle, of recent introduction, termed the Law of Correlation, Conservation, or Persistence of Force, serves to connect Physics with Chemistry, and imparts to the two taken jointly a greater unity than belongs to Physics singly. The third and last group is CONCRETE SCIENCE, or natural phenomena in their totalities, or as united in actual things—Astronomy, Biology, Psychology, Sociology, Geology, etc. John Stuart Mill (*Westminster Review*, 1865, Apr.) described Comte's scheme at length, and criticised that of Spencer: see SPENCER, HERBERT.

It may be held as generally admitted that Mathemtiacs, Physics, Chemistry, Biology, and Psychology, with or without Sociology, are the sequence of the primary or fundamental S.; and that the Natural History group, not containing any new laws of nature, are not fundamental. Astronomy, or the laws of the solar system and of the other celestial bodies, might be called a Natural History or Concrete science, if we supposed a prior abstract science that discussed the operation of gravity, together with the laws of motion in bodies generally, or without special application to the existing solar and sidereal systems. The first book of Newton's *Principia* would be the Abstract, the third book the Concrete, form of the science.

The Practical S. do not admit of any regular classification. They are as numerous as the separate ends of human life that can receive aid from science, or from knowledge scientifically constituted. Connected with Mind and Society, we have Theology, Ethics, Logic, Rhetoric, Grammar, Philology, Education, Law, Jurisprudence, Politics, Political Economy, etc. In the manual and mechanical arts are Navigation, Practical Mechanics, Engineering Civil and Military, Mining and Metallurgy, Chemistry applied to Dyeing, Bleaching, etc.

The medical department contains Medicine, Surgery, Midwifery, Materia Medica, Medical Jurisprudence. A science of Living, or of the production of Happiness by a skilled application of all existing resources, was greatly desiderated by Plato, and would be the crowning practical science.

See the titles of the various main subjects enumerated in this article; also the references under them.

SCIENTER, ad. *sī ĕn'tĕr* [L.]: in *law*, knowingly; willfully.

SCILICET, conj. *sĭl'ĭ-sĕt* [L. *scilicet*, evidently, certainly—from *scirĕ licet*, it is permitted to know, you may know]: namely; viz.; to wit.

SCIL'LA: see SQUILL.

SCILLITINE, n. *sĭl'lĭ-tĭn* [L. *scilla;* Gr. *skilla*, the sea-onion or squill: F. *squille*]: the bitter principle of the bulb of the squill or sea-onion, much used as a domestic medicine.

SCILLY ISLES, *sĭl'lĭ:* group of about 40 islands, in a circuit of about 30 m.; about 25 m. w.-by-s. of Land's End, 40 m. w. from Lizard Point; a little w. of 6° w. long. and about 50° n. lat.; the most southern parts of the United Kingdom of Great Britain, except the Channel Islands. The group is named from a very small island, about an acre in extent, almost inaccessible, called Scilly, probably from its position near dangerous rocks, similar to that of Scylla near Sicily. By the ancients, these islands, it has been com-

Scilly Islands.

monly understood, were named Cassiterides, Hesperides, and Silurae Insulae. Some authorities have assumed that the term Cassiterides, or 'Tin Islands,' under which they were known to the Greeks and Romans, was applied anciently to the peninsula of Cornwall, of which county they now form part. Elton, in *Origins of English History*, affirms, however, that the Cassiterides were the headlands of Galicia, or the islands off that part of the Spanish coast, and not the Scilly Islands at all.

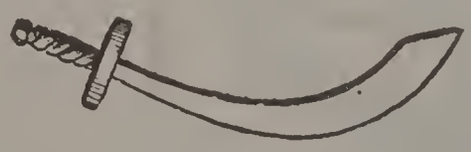
Numerous remains are seen of rude pillars, circles of stones, kistvaens, rock-basins, and cromlechs. The granite of which the islands are composed is, in general, rather coarse; and from its color, iron seems to be frequently associated with it. There are metalliferous veins, or lodes, in some rocks, but none that could have yielded any considerable quantity of ore. The S. I. were 936 granted by Athelstane to some monks who settled at Tresco. They

were afterward granted to the Abbey of Tavistock by Henry I., and were conferred by Queen Elizabeth on the Godolphin family. They are now the property of the crown.

Only five of the islands are inhabited. St. Mary's, the largest, comprises 1,528 acres; Tresco, 697; St. Martin's, 515; St. Agnes (a light-house station), 313; Sampson and Bryher, 269. The inhabitants are chiefly engaged in agriculture. Barley, oats, and a little wheat are grown. Large quantities of potatoes are sent to London and Bristol. Fishing occupies some of the people. The climate is mild, and vegetation luxuriant. The soil is in general sandy, but in Tresco and St. Agnes it is remarkably fertile. The cliffs abound with sea-fowl, and are covered with samphire. Hugh Town, on St. Mary's, is the capital, an odd mixture of old-fashioned and neat modern houses. St. Mary's has a wild and picturesque coast-line, with precipices and caves. At Tresco are the remains of an abbey founded in the 10th c.; also the ruins of Oliver Cromwell's camp, castle, and battery, built by the Protector. St. Agnes, about three m. s.w. from St. Mary's, is well cultivated and has some fine rock-scenery: the principal building is the light-house, 72 ft. high, containing a revolving light, seen at a distance of 18 miles.

St. Mary's has a pop. of 1,400; the other four inhabitated islands (Tresco, St. Martin's, St. Agnes, Bryher) have a pop. collectively 700: total pop. 2,100.

SCIMITAR, or SCIMITER, or SIMITAR [Fr. *cimeterre* —from It. *scimiterra;* Sp. *cimitarra;* Pers. *shamsher*, sword]: short curved sword having its edge on the convex side; used among eastern nations. Being usually of high temper, and its shape favorable to incision, it is a formidable cutting instrument, but is powerless as a thrusting weapon, and is not any match for the bayonet. See CIMETER.



Scimitar.

SCINCOIDS, n. plu. *sĭng'koyds*, or SCINCOIDIANS, *sĭng-koyd'ĭ-ăns* [Gr. *skingkos*, a species of lizard; *eidos*, resemblance]: a family of lizards, of which the *scincus* or *skink* is the type.

SCINDE, or SINDE: see SIND.

SCINK: see SKINK.

SCINTILLATE, v. *sĭn'tĭl-lāt* [L. *scintil'la*, a spark: F. *scintiller*, to sparkle]: to emit sparks; to sparkle, as the fixed stars. SCIN'TILLATING, imp. SCIN'TILLATED, pp. SCIN'TILLANT, a. *lănt*, sparkling; emitting sparks. SCIN-TILLA'TION, n. *-lā'shŭn* [F.—L.]: the act of emitting sparks, or sparkling.

SCINTILLA'TION: term denoting the sparkling, or the flickering gleam, of the stars. The phenomenon is not yet quite explained; but that it is due to the earth's atmosphere is proved by the following facts, which embrace nearly all that is known on the subject. If, on a clear

evening, we look at a bright star, e.g., Sirius, we observe that the intensity and color of its light are constantly changing—from great brilliancy to almost total obscurity, from bright red to fine blue, and so on. As it rises above the horizon, these appearances diminish in intensity; and stars near the zenith scarcely scintillate at all. Again, the amount of the S. depends on the character of the weather—on some evenings, all large stars appear to scintillate strongly; on others, there is barely a trace of the appearance. It is commonly said that a planet can be distinguished from a star by the absence of S. This is nearly, but not quite, true; for feeble scintillations have been occasionally observed in Mars and Venus, and very rarely in Jupiter and Saturn. One of the reasons of the non-scintillation of planets seems to be their finite apparent size; for all the more conspicuous planets show a sensible disk even in a poor telescope, while no instrument ever constructed has shown a real disk in a fixed star. Thus, a single particle or vesicle of vapor may be large enough to conceal a star for an instant, while it could have no such effect on a planet. It is nearly certain that S. is not due to unequally heated masses of air, since it usually modifies only the *appearance*, not the *position*, of a star. Another cause of S. is easily seen in the comparatively feeble light of the planets. The S. is much less when viewed from a mountain-top.

SCIO (It. corruption of the old Greek name CHIOS): one of the Sporades (islands) in the Archipelago; modern Greeks, however, call it *Chio*. S., one of the most beautiful islands in the Ægean Sea, belongs to Turkey: it lies seven m. off the coast of Asia Minor, at the entrance to the Gulf of Smyrna. It is 32 m. long from n. to s., and 8 to 15 m. wide; 400 sq. m. Pop. about 60,000. It is mountainous in the n.—called 'craggy' in the Homeric hymn; and is extremely fertile. Silk, figs, cheese, wool, and gum-mastic are principal products; and its wine, famous in ancient times, is still esteemed. Kastro (more properly Scio), the cap., a thriving and handsome town (pop. about 17,000), is on the e. coast; has a harbor, a castle, and two light-houses; and has a growing trade in fruits, confectionery, and silk and woolen goods. The s. portion—the smallest—is least mountainous, and most fertile and wealthy.

In early times, S. formed one of the 12 Ionian states, and it contributed 100 ships to the Greek force that fought and was defeated by the Persians in the sea-fight off Miletus (B.C. 494). Its earliest history is very obscure. Chios developed the handicrafts and the arts at a very early period: Chian sculptors were famous B.C. 660–540; and the poet Ion and the historian Theopompus are illustrations of its literary art. In more recent times, the island was taken by the Genoese 1346, and by the Turks 1566, in whose hands it has since, except for a short interval, remained. It was conferred as private property on the sultana, had her protection, and consequently prospered. After a long period of ease and wealth, a dreadful calamity

befell the island at the outbreak of the Greek insurrection. A number of the Sciotes having, 1822, joined the Samians, who had revolted, the island was attacked by a Turkish fleet and army, and the inhabitants, enervated by peace and wealth, were indiscriminately massacred; 25,000 fell by the sword, 45,000 were sold as slaves, and 15,000 escaped from the island. Gradually the island has recovered the blow it sustained. 1881, Mar. 27—Apr. 6, S. was devastated by a series of violent earthquake shocks. The first shock occurred on Sunday and was very severe. The Genoese fortress and about 400 houses were destroyed, and the surface of the ground settled about 20 inches. Horizontal oscillations followed the vertical shock. The centre of disturbance appeared to be near Nenita, on the e. coast, where one-fourth of the population was killed. On the opposite side of the island there was no loss of life, though many houses were wrecked. In the s. and s.e. parts of the island nearly all the houses were destroyed, and more than 1,300 people lost their lives. Out of a total population of 70,000, about 4,000 were killed, 10,000 to 15,000 were injured, and 30,000 were left homeless. The survivors were relieved by subscriptions taken in Europe and the United States.

SCIOGRAPHY, n. *sī-ŏg'rā-fĭ:* see SCIAGRAPHY.

SCIOLISM, n. *sī'ō-lĭzm* [L. *sci'olus*, a smatterer—from *sciō*, I know: It. *sciolo*, a pretender to learning]: superficial knowledge. SCI'OLIST, n. *-lĭst*, one who has a smattering of many things.

SCIOMANCY, n. *sī'ō-măn-sĭ* [Gr. *skia*, a shadow; *manteï'a*, divination]: divination by the shadow.

SCION, n. *sī'ŏn* [F. *scion*, a young and tender plant—from *scier*, to saw—from L. *secārĕ*, to cut]: a small twig or branch cut from one tree and grafted on another; any young branch or member, applied to the families of the nobility.

SCIOPPIUS, *stsē-ŏp'pē-ûs* (Latinized form of *Schoppe*), KASPAR: noted classical scholar and controversialist: 1576, May 27—1649, Nov. 19; b. Neumark, in the Palatinate. He studied at Heidelberg, Altdorf, and Ingolstadt. He became known by his Latin verse and his notes on different Latin authors. He soon abjured Protestantism, becoming a Rom. Catholic; and was decorated by the pope with various titles, and received a pension of 600 florins, with a residence in the Vatican. Henceforth, his career was a series of onslaughts chiefly on his former co-religionists, but also against any whom accident or malice led him to hate. The first person whom he attacked was the illustrious Scaliger (q.v.), against whom, 1607, he launched his *Scaliger Hypobolimæus* (Mainz). In this production, Henry IV. is also assailed. Sent 1608 by the court of Rome to the diet of Ratisbon, to observe the religious condition of Germany, he published in the same year more than 20 pamphlets against the Protestants, recommending the Rom. Cath. powers to use every means for their extermination. As the Emperor of Germany was a devoted Rom. Catholic, S., on visiting Vienna, met with much favor,

and was raised to the dignity of courn-palatine. In 1611 he fired off two libels against King James I. of England; the first, *Ecclesiasticus Authoritati Ser. D. Jacobi, Mag. Brit. Regis, Oppositus* (Hartberg); the second, *Collyrium Regium*, etc. About three years afterward, when staying at Madrid, he was dreadfully beaten by the domestics of Lord Digby, the English ambassador, in retaliation for the abuse of his sovereign. Scioppius then issued his *Legatus Latro* against the ambassador.

SCIOPTIC, n. *sī-ŏp'tĭk*, or SCIOP'TRIC, n. *-trĭk* [Gr. *skĭa*, a shadow; *optĭkos*, pertaining to the sight]: a sphere or globe with a lens fitted to a camera, and made to turn like the eye: ADJ. pertaining to. SCIOP'TICS, n. plu. *-tĭks*, the science of exhibiting the images of external objects, by means of the camera-obscura.

SCIOTO COMPANY, THE: in American history, a land-speculating organization formed in 1787 for the purchase of territory along the Ohio and Scioto rivers. John Cleves Symmes, Joel Barlow and William Duer, of New York, were largely interested. Barlow was sent to Europe in the company's interest as emigration agent. Symmes parceled out the lands to other parties, the tract which now embraces the city of Cincinnati falling to the share of Matthias Denman, Robert Patterson, and John Tilson, of New Jersey.

SCIOTO, *sī-ō'tō*, RIVER: rising in the high lands of n.w. Ohio, and flowing s.e. to Columbus, then s. to its junction at Portsmouth with the river Ohio. It is 200 m. long, and is navigable 130 m.

SCIPIO, *sĭp'ĭ-ō*, PUBLIUS CORNELIUS, surnamed AFRICANUS MAJOR: one of the most accomplished warriors of ancient Rome, but whose reputation is perhaps somewhat greater than his merits: B.C. 237 (or 234)—B.C. 183 (or 185); son of Publius Cornelius Scipio, who was consul B.C. 218. Africanus Major (Elder) is mentioned first as taking part, though only a youth, in the battle of the Ticinus, B.C. 218, where he saved his father's life. B.C. 212 he was elected ædile, though not legally qualified by age; and in the following year, proconsul, with command of the Roman forces in Spain. His appearance there restored fortune to the Roman arms. By a bold and sudden march he captured *Nova Carthago*, the stronghold of the Carthaginians, and obtained immense booty. His humane and courteous manners won over many of the native chiefs; and when he began the campaign of B.C. 209 his superiority over his opponents in address, if not in generalship, was manifest. At Bæcula, in the valley of the Guadalquiver, he defeated Hasdrubal with heavy loss, but could not prevent him from crossing the Pyrenees to the assistance of Hannibal. B.C. 207 he won a more decisive victory over the other Hasdrubal, at place called Silpia, or Elinga, somewhere in Andalusia—thus placing all Spain in the hands

of the Romans. Soon afterward he returned to Rome, where he was elected consul B.C. 205, though he had not yet filled the office of pretor; and in the following year he sailed from Lilybæum, in Sicily, at the head of a large army, for invasion of Africa. His successes compelled the Carthaginian senate to recall Hannibal from Italy. This was the very thing that S. had labored to achieve. After abortive efforts at reconciliation, the great struggle between Rome and Carthage, between S. and Hannibal, was terminated by the battle at Naragra, on the Bagradas, near Zama, B.C. 202, Oct. 19, in which the Carthaginian troops were routed with immense slaughter. Hannibal advised his countrymen to abandon what had now become a hopeless and ruinous contest, and his advice was followed. Peace was concluded in the following year, when S. returned to Rome, and received a triumph. The surname AFRICANUS was conferred on him; and so extravagant was the popular gratitude, that it was proposed to make him consul and dictator for life, honors that would have been the destruction of the constitution, but which S. was either wise enough or magnanimous enough to refuse. When his brother Lucius, 190, obtained the command of the army destined to invade the territories of Antiochus, S. served under him as legate; in fact, it was only when S. offered to do so, that the senate granted Lucius the province of Greece. Lucius, with his brother, was victorious in the war, and on his return to Rome B.C. 189, assumed (in imitation of his brother) the surname ASIATICUS. But the clouds were now gathering heavily round the Scipios. B.C. 187 Cato Major and others induced two tribunes to prosecute Lucius for allowing himself to be bribed by Antiochus in the late war. He was declared guilty by the senate; his property was confiscated; and he himself would have been thrown into prison, had not his brother forcibly rescued him from the hands of the officers of justice. B.C. 185. S. himself was accused by the tribune, M. Nævius; but instead of refuting the charges brought against him (which were probably groundless), he delivered, on the first day of his trial, a eulogy on his own achievements, and opened the second day by reminding the citizens that it was the anniversary of the battle of Zama, and therefore not a time for angry squabbling, but for religious services. He then summoned the people to follow him to the capitol, to give thanks to the immortal gods, to pray that Rome might never want citizens like himself. His audience were electrified, and the thing was done before opposition became possible. To resume the trial, was out of the question; but S. felt that popular enthusiasm was not to be trusted; that the power of the oligarchy—that compact body of ambitious and exclusive nobles—was irresistible; that its hatred of him was unappeasable, and that his day was over. He retired to his country seat at Liternum, in Campania, where he spent the remainder of his life. S.'s daughter Cornelia was mother of the two famous Gracchi. S. is commonly regarded as the greatest Roman general before Julius Cæsar; and certainly, in the brilliancy of his gifts

and accomplishments, he was unsurpassed; but if his career be strictly criticised, it will be found that he owed as much to fortune as to genius. Nevertheless, he won a multitude of splendid successes, and made the most of his great advantages. His beauty, bravery, and courtesy; his proud, yet pious belief that the gods favored him with their inspiration, won him the love and reverence of soldiers and women; and his magnanimity toward his fallen rival, who flitted about the eastern courts in dreary exile, is a bright feature in his character, and nobly distinguishes him from the cruel-hearted oligarchs of the senate.

SCIP'IO ÆMILIANUS, *ĕm-ĭl-ĭ-ā'nŭs*, PUBLIUS CORNELIUS, surnamed AFRICANUS MINOR: B.C. 185—B.C. 129; younger son of Lucius Æmilius Paulus, who conquered Macedon, but was adopted by his kinsman, Publius Scipio, son of the great Scipio, who had married the daughter of that Lucius Æmilius Paulus who fell at Cannæ. S. accompanied his father on his expedition against Macedon, and fought at the decisive battle of Pydna, B.C. 168. In Greece, he made the acquaintance of Polybius the historian, who afterward became one of his closest friends. B.C. 151 he went to Spain as military tribune, in the wake of the consul Lucius Lucullus, where he distinguished himself by his valor and his virtue. Two years later, began the third and last Punic war, which consisted mainly in the siege of Carthage. S. still held the subordinate position of military tribune; but the incapacity of the consuls, Manius Manilius, and Lucius Calpurnius Piso, and the brilliant manner in which he rectified their blunders, fixed all eyes on him. The favorite both of the Roman army and the Roman people, S. was at length, B.C. 147, when only a candidate for the ædileship, elected consul by an extraordinary decree of the Comitia, and invested with supreme command; old Cato, who could with difficulty be got to praise any one, applying to the young hero and his incapable comrades (according to Plutarch) the Homeric line—

> He only is a living man; the rest are flitting shades.

The story of the siege of Carthage is well known—the despairing heroism of its inhabitants; the determined resolution, the sleepless vigilance, the incessant labors of S. After a protracted defense of months, the city was finally taken by storm in the spring of B.C. 146; and by the orders of the senate, it was levelled to the ground, and the plowshare driven over its site. S., a man of noble and refined soul, obeyed the savage behest with sorrow, even with horror. As he gazed on the ruin that he had wrought, the thought flashed across his mind that some day Rome too might perish, and the words of the *Iliad* rose to his lips—

> The day shall come when sacred Troy shall perish,
> And Priam and his people shall be slain.

S., though probably the most accomplished Roman gentleman of his age, was rigorous in his observance of the antique Roman virtues; and when holding the office of

censor B.C. 142, he strove to follow in the footsteps of Cato. But his efforts to repress the increasing luxury and immorality of the capital were frustrated by the opposition of his colleague, Lucius Mummius, the rough conqueror of Corinth. B.C. 139 S. was accused of the *crimen majestatis* by the tribune Tiberius Claudius Asellus, but was acquitted; and soon was sent to Egypt and Asia on a special embassy. Meanwhile, however, affairs had gone badly in Spain. Viriathus, the Lusitanian patriot, had again and again inflicted disgraceful defeats on the Roman armies; and his example had roused the hopes of the Celtiberian tribes, who also rushed to war against the common foe. The contest continued with varying success; but the interest centres in the city of Numantia, whose inhabitants showed amazing courage in the struggle with Rome. For long it seemed as if the Numantines were invincible—one consul after another finding their subjugation too hard a task—but at length, B.C. 134, S., re-elected consul, was sent to Spain; and after a siege of eight months, forced the citizens, who were dying of hunger, to surrender, and utterly destroyed their homes. He then returned to Rome, where he was prominent in political affairs, appearing as the leader of the aristocratic party; in consequence of which his popularity with the democratic party greatly declined. Although a brother-in-law of Tiberius Gracchus, whose sister, Sempronia, he had married, he disclaimed sympathy with his political aims; and when he heard of the murder of his kinsman, quoted his favorite Homer: 'So perish all who do the like again.' His attempt B.C 129 to rescind that portion of the agrarian law of Tiberius Gracchus relating to the lands of the *Socii*, excited furious indignation. When he went home from the senate, he had to be accompanied by a guard. Next morning he was found dead in his bed; the prevailing suspicion being, that he was murdered either by or at the instigation of Papirius Carbo, his most rancorous political enemy. S. was neither a rigid aristocrat nor a flatterer of the people. Inferior in splendor of genius to his adoptive grandfather, he surpassed him in purity of character, in simplicity of patriotism, and in liberality of culture.

SCIRE FACIAS, *sī'rē fā'shĭ-ăs* [L., notify; *lit.*, 'make to know']: judicial writ to enforce execution of a judgment, recognizance, patent, or other matter of record; or to vacate, quash, or annul such record. The writ S. F. directs the sheriff to notify the person against whom a judgment stands, or who has given a recognizance, or to whom a patent or a charter has been granted, of intention to enforce such judgment, to obtain execution of such recognizance, or to procure cancellation or forfeiture of letters patent.

SCIROCCO, n. *sĭ-rŏk'kō*, or SCIROC, *sī'rŏk:* see SIROCCO.

SCIRPUS, *sėr'pŭs:* genus of plants of nat. order *Cyperaceæ.* The English name Club-rush is sometimes given to them. The Common Bulrush is a familiar example; also *S. pungens,* smaller species with three-sided stems, best adapted for use, as in rush-bottomed chairs. There are some species very small in comparison with the Bulrush, as *S. cæspitosus,* called *Deer's Hair* in the Highlands of Scotland, only two or three inches high, affording food to sheep on the moors in spring. The root-stocks of *S. dubius* are eaten by the natives of s. India; as are the roundish tubers of *S. tuberosus,* called *Pi-tsi* by the Chinese, and cultivated by them in tanks and ponds.

SCIRRHUS, n. *skĭr'rŭs* [L. *scirros;* Gr. *skirrhos,* a hard swelling—from *skiros,* hard]: in *surg.,* a hard cancer on any part of the body, often occurring in the breast (see CANCER: TUMORS). SCIR'RHOUS, a. *-rŭs,* hard; knotty, as a gland; proceeding from a scirrhus. SCIRRHOS'ITY, n. *-rŏs'ĭ-tĭ,* morbid hardness. SCIRRHOMA, n. *skĭr-rō'mă* or *sĭr-rō'mă,* a tumor of a marble-like appearance and consistence.

SCISSILE, a. *sĭs'ĭl* [F. *scissile*—from L. *scis'sĭlis,* that may easily be split or rent—from *scissus,* cut, rent; *scindĕrĕ,* to divide: It. *scissile*]: that may be cut or divided by a sharp instrument. SCISSIL, or SCISSEL, n. *sĭs'ĭl,* the waste clippings of metals; the slips or plates of metal out of which the blanks for coinage have been cut. SCISSION, n. *sĭzh'ŭn* [F.—L.]: the act of cutting or dividing by an edged instrument.

SCISSORS, n. *sĭz'ėrz* [OF. *cisoires;* F. *ciseaux,* scissors —probably from L. *secārĕ,* to cut: OE. *sisoures*]: a well-known cutting instrument consisting of two blades moving on a pivot.

SCISSURE, n. *sĭzh'ūr* [L. *scissūra,* a dividing, a rent—from *scindĕrĕ,* to divide: F. *scissure*]: in *anat.,* an opening made by cutting lengthwise.

SCITAMINEÆ, *sĭt-a-mĭn'ē-ē* or *sī-ta-,* or ZINGIBERACEÆ, *zĭn-jĭ-bėr-ā'sē-ē:* natural order of endogenous plants, herbaceous perennials. There are about 250 known species, all tropical or sub-tropical, among which are the different kinds of Ginger, Galangale, Zedoary, Cardamom, Grains of Paradise, Turmeric, etc. Most of them are notable for aromatic properties, chiefly in their root-stocks or their seeds. The root-stocks of some, particularly when young, contain much starch, which is used as arrow-root.

SCIURINE, a. *sī-ū'rĭn* [L. *sciūrus;* Gr. *ski'ouros,* a squirrel—from *skia,* a shadow; *oura,* a tail]: having the character of the squirrel tribe. SCIURIDÆ, n. plu. *sī-ū'rĭ-dē,* a family of rodents, including flying squirrels, true squirrels, and marmots. See SQUIRREL.

SCLERENCHYMA, n. *sklĕr-ĕng'kĭ-mă* [Gr. *sklēros,* hard; *engchuma,* what is poured in, tissue]: the calcar-

eous tissue of which a coral is composed; in *bot.*, tissue of thickened and hard cells or vessels.

SCLERETINITE, n. *sklĕr-ē'tĭ-nīt* [Gr. *sklēros,* hard; *rhētīnē,* resin]: one of the mineral resins, occurring in roundish drops and pellets of a black color, nearly allied in composition to amber.

SCLERIASIS, n. *sklēr-ī'a-sĭs* [mod. L.—from Gr. *sklēria,* hardness]: any hard tumor or induration.

SCLERITES, n. plu. *sklĕr'īts* [Gr. *sklēros,* hard]: the calcareous spicules scattered in the soft tissues of certain actinozoa.

SCLEROBASIC, a. *sklĕr'ō-bā'zĭk* [Gr. *sklēros,* hard; *basis,* a foundation, a pedestal]: applied to the coral produced by the outer surface of the integument in certain actinozoa, forming a solid axis invested by the polypites —called the SCLEROBASE, n. *sklĕr'ō-bās.*

SCLERODERMOUS, a. *sklĕr'ō-dėr'mŭs* [Gr. *sklēros,* hard; *derma,* skin]: hard-skinned; pertaining to the SCLERODERMS, n. plu. *-dėrms,* or SCLERODER'MI, family of fishes, variously classified, having skins covered with hard scales (see BALISTES). SCLERODERMA, n. *sklĕr'ō-dėr'mă,* a diseased condition in which the skin hardens and indurates. SCLER'ODERMIC, a. *-dėrmĭk,* applied to the corallum deposited between the tissues of certain actinozoa. SCLER'ODER'MITE, n. *-dėr'mīt,* the hard skeleton in the crustacea; the corallum deposited within the tissues of certain actinozoa.

SCLEROGEN, n. *sklĕr'ō-jĕn* [Gr. *sklēros,* hard; *gennăo,* I produce]: the thickening or woody matter deposited in the cells of plants.

SCLEROMA, n. *sklĕr-ō'mă* [Gr. *sklērōma,* an induration—from *sklēros,* hard]: in *med.*, hardness of texture; an induration, occurring in the nose or larynx.

SCLEROSIS, n. *sklĕ-rō'sĭs* [Gr. *sklēros,* hard]: the hardening of a part by an increase of its connective tissue SCLEROT'IC, a. *-rŏt'ĭk,* hard or firm—applied to the external membrane of the eye: N. the outer dense fibrous coat of the eye, forming the white of the eyeball; in *med.*, a substance that hardens parts to which it is applied: also SCLEROTICA, n. *sklĕ-rŏt'ĭ-kă,* in same sense. SCLEROTIC-TUNIC, n. the external of the three tunics of the eye, with the cornea, giving it its peculiar form. It is a dense, fibrous membrane, continuous posteriorly with the optic nerve. SCLEROTOME, *sklĕr'ō-tōm* [Gr. *tomē,* a cutting]: a segment of the skeleton of the body; an instrument used to cut the sclerotic of the eye. SCLEROTOMY, n. *sklĕ-rŏt'ŏ-mĭ,* an incision of the sclerotic.

SCLEROSTOMA, *sklē-rŏs'tō-mâ* [Gr. *scleros,* hard; *stoma,* mouth]: genus of the family of *Strongylidæ,* belonging to the order of round worms or Nematoidea. The genus is distinguished by a truncated round head, and large round mouth lined by a horny substance; hence the name. A common species infesting horses, *S. equinum,*

is 1 in. or more in length, reddish or brown, with both lengthwise and cross lines, the mouth edged with fine-toothed fringes. It occurs abundantly in the intestine, and also in aneurisms of the mesenteric artery, supposed to be caused by irritation of the intestinal worm; but it does not seem to work any serious injury. One species, the *Sclerostoma syngamus*, is the cause of the disease in poultry known as the Gapes (q.v.). The entozoon which infests the windpipe of the diseased birds is not a trematoid (or fluke-like) worm, but a round worm, possessing many very singular properties. Dr. Cobbold removed from a chloroformed fowl, with the gapes, seven sclerostomata. 'Six of these parasites were united in pairs, the odd worm being a female, from which the male had in all likelihood been rudely torn during the withdrawal of the forceps' (*Entozoa*, 1864, p. 86). The females thus extracted had an average length of $\frac{5}{8}$ of an inch; while the males scarcely exceeded $\frac{1}{8}$ of an inch. In both sexes, the breadth of the body was nearly uniform throughout, being about $\frac{1}{35}$ of an inch in the female, and only $\frac{1}{55}$ of an inch in the male. The mouth of the female is furnished with six prominent chitinous lips. According to Siebold, after sexual congress, 'there is ultimately a lasting continuity of the sexes by means of an actual growing together'—one of the most remarkable facts in natural history. Hence the eggs, comparatively large, and many containing fully formed embryos, can escape only by a breaking-up of the body of the parent. 'By whatever mode,' says Dr. Cobbold, 'the young make their *exit* from the shell, it is manifest that, prior to their expulsion, they are sufficiently developed to undertake an active migration. Their next habitation may occur within the bodies of certain insect larvæ, or even in small land mollusks; but I think it more likely that they either enter the substance of vegetable matters, or bury themselves in the soil at a short distance from the surface.'

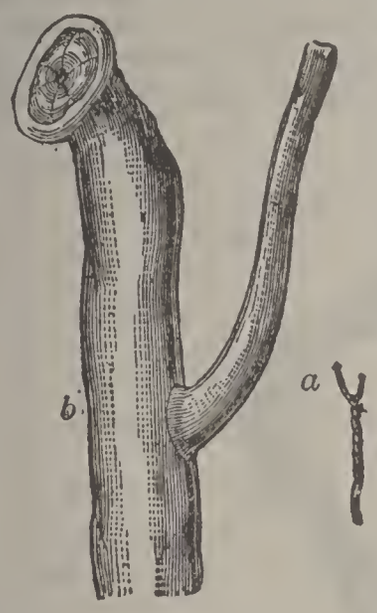


Fig. 1.—Sclerostoma syngamus.

a, Male and female—natural size; *b*, upper part of the same, enlarged (from Cobbold). The male is the smaller worm on the right side of these figures.

Considering that this worm infests the trachea of the domestic fowl, the turkey, the pheasant, and the partridge, as well as of many birds of less importance (as the magpie, the black stork, the starling, the swift, etc.), it is important to check its development. With this view, the worms must not only be removed by the means described in the article GAPES, and more fully in Cobbold's *Entozoa*, 90, 91, but they must be *totally destroyed* after their removal. If they be merely killed and thrown on the

ground, the mature eggs will probably remain uninjured; and when decomposition sets in, the young embryos will, sooner or later, escape from the shells, migrate in the soil or elsewhere, and ultimately find their way—how, we cannot tell—into the air-passages of certain birds, in the same manner as their parents did before them.

Dr. Cobbold places the *Dochmius anchylostomum*, or *Anchylostoma duodenale* (see STRONGYLIDÆ), in this genus, with the name *Sclerostoma duodenale*. This worm, usually about $\frac{1}{3}$ of an inch in length, is characterized especially

Fig. 2.—Sclerostoma duodenale—Male specimen.

1, The natural size; 2, the same magnified, and seen laterally; *a*, generative organ; *b*, region of anus.

by an asymmetrical disposition of four horny, conical, oval papillæ, of unequal size, forming the so-called teeth. The female is larger than the male in about the ratio of 4 to 3, and is the more numerous in the ratio of 3 to 1. This worm was discovered 1838 by Dubini at Milan, and though at first thought rare, is now known to be somewhat frequent throughout n. Italy. It is remarkably abundant in Egypt, where Pruner found it in nearly every corpse, sometimes, in hundreds of specimens, in the jejunum, and to a less extent in the duodenum. Griesinger, in his Memoir *On the Frequency of Entozoa in Egypt, and the Diseases They Occasion* (1854), considers that about one-fourth of the population are constantly suffering from a severe anæmic chlorosis, occasioned solely by the presence of this parasite. See, besides Cobbold's *Entozoa* (1864) and *Parasites* (1879), Küchenmeister, *Die Parasiten des Menschen* (2d ed. 1881); and works by Leuckart, Schneider, and Bastian.

SCLEROTIUM, *sklĕ-rō'tĭ-ŭm* [Gr. *sklēros*, hard, in allusion to the texture of the plants]: spurious genus of fungi, now regarded as merely the mycelium of fungi, and these probably of very different kinds, which have been arrested in their development, assuming a peculiar form. This form is that of a fleshy mass, often a ball. Examples are to be found among almost all kinds of decaying vegetable matter, as fruits, esculent roots, etc. When a crop of onions rots off, a S. may generally be found attached to the bulbs in the form of little irregular black masses, or as a multitude of small granules. On the under side of decaying cabbage-leaves, and scattered on the ground beneath the plant to which they belong, may likewise be seen little balls, varying from white or reddish-brown to dark brown and black, in size about equal to cabbage-seeds—whence stories of showers of seeds have sometimes originated. SCLEROTIA, n. *-tĭ-ă*, the fungus disease of India; the louping disease of sheep.

SCLEROTOID, a. *sklĕr'ō-toyd* [Gr. *sklēros*, hard; *eidos*, resemblance]: having the form and consistence of *Sclerotium*.

SCOAT: see SCOTCH 2.

SCOBIFORM, a. *skŏb'ĭ-fawrm* [L. *scobis*, powder or dust produced by sawing or rasping—from *scabo*, I scrape; *forma*, form]: in *bot.*, in the form of filings, or like fine sawdust.

SCOBINA, n. *skŏ-bī'nă* [L. *scobīna*, a rasp or file—from *scabo*, I scrape]: in *bot.*, the zigzag rachis of the spikelets of grasses. SCOBINATE, a. *skŏ-bī'nāt*, having the surface rough like a file.

SCOBS, n. *skŏbz* [L. *scobis*, sawdust—from *scabo*, I scrape]: raspings or turnings of ivory, metals, etc.; sawdust.

SCOFF, n. *skŏf* [Icel. *skaup*, derision: O.Dut. *schoppen*, to scoff]: an expression of scorn or contempt; derision; mockery; a mark for derision: V. to treat with ridicule, contempt, or mockery—generally with *at*. SCOFF'ING, imp.: N. the act of treating with scorn: ADJ. treating with reproachful language. SCOFFED, pp. *skŏft*. SCOFF'ER, n. *-ĕr*, one who scoffs. SCOFF'INGLY, ad. *-lĭ*.—SYN. of 'scoff, v.': to sneer; mock; jeer; gibe.

SCOKE, n. *skōk*: in *bot.*, poke-weed, *Phytolacca decandra*: see PHYTOLACCA.

SCOLD, n. *skōld* [Dut. *scheldan*, to scold, to revile; *scheldnaem*, a name of abuse: Icel. *skellr*, clang, crash; *skella*, to bang: Sw. *skalla*, to bark like a dog, to scold]: a rude, clamorous foul-mouthed woman: V. to reprimand with harshness or severity; to rebuke or reprove; to vituperate; to rail at with rude clamor. SCOLD'ING, imp.: N. railing language; the act of rebuking or reproving with undue severity; a rating: ADJ. habitually given to the use of harsh or railing language, generally used in reference to women. SCOLD'ED, pp. SCOLD'ER, n. *-ĕr*, one who scolds; SCOLD'INGLY, ad. *-lĭ*.

SCOLECIDA, n. plu. *skŏl'ĕ-sī'dă* [Gr. *skōlēx* or *skōlēka*, a worm]: a heterogeneous division of the Annuloida now abandoned.

SCOLECITE, n. *skō-lē'sīt* [Gr. *skōlēx*, a worm—in reference to the mineral's behavior before the blowpipe]: a mineral found in whitish fibrous tufts in trap-rock and basalt.

SCOLEX, n. *skō'lĕks* [Gr. *skōlēx*, a worm]: embryonic stage of a tape-worm; formerly called a cystic worm. See TAPE-WORM; CESTOID WORMS.

SCOLIOSIS, n. *skŏl-ĭ-ō'sĭs* [Gr.—from *skolĭŏs*, crooked]: in *med.*, crookedness; distortion of the vertebral column to one side; lateral curvature of the spine.

SCOLITHUS, n. *skō-lī'thŭs*, or SCOLITES, n. plu. *skō'-līts* [Gr. *skolĭŏs*, crooked, tortuous; *lithos*, a stone]: in *geol.*, terms applied to those tortuous tube-like markings which occur in certain sandstones, and which appear to have been worm-burrows.

SCOLLARD, *skŏl'ard*, CLINTON: American poet and novelist: b. Clinton, N. Y., 1860, Sep. 18. He was graduated from Hamilton College in his native place and was a professor of rhetoric and English literature there 1888-96. Among his books may be cited *Pictures in Song* (1884); *With Reed and Lyre* (1886); *Old and New World Lyrics* (1888); *Songs of Sunrise Lands* (1892); *Lyrics of the Dawn* (1900); *The Lutes of Morn* (1901); *A Man at Arms* (1898); *The Son of a Tory* (1900); *The Cloistering of Ursula* (1902); *Footfarings* (1904); *The Lyric Bough* (1904); *Odes and Elegies* (1905); *Easter Song* (1907); etc.

SCOLLOP, *skŏl'lŏp*. See SCALLOP.

SCOLOPACIDÆ, *skŏl-ō-păs'ĭ-dē:* family of birds of the order *Grallæ*, having a long, feeble, soft, and somewhat flexible bill remarkably furnished with nerves, particularly toward the tip, so as to be extremely sensitive, while many of them have also a peculiar muscle, enabling them to separate the points of the mandibles instantly when their prey is felt. They are thus admirably fitted for seeking their food—generally worms, slugs, etc.—in mud, soft earth, or wet sand. The membrane of the tip of the bill is almost pulpy in many of them. The species are numerous, and very widely distributed, generally inhabitants of swampy or very moist places.

SCOLOPAX, n. *skŏl'o-păks* [L.—from Gr. *skolōpax*, a snipe, a woodcock]: typical genus of the family *Scolopacidæ*, a cosmopolitan family of Grallæ, comprising the snipes, sandpipers, curlews, and allied genera.

SCOLOPENDRA, n. *skŏl'ŏ-pĕn'dră* [L. *scolopen'dra;* Gr. *skolopen'dra*, a sort of multiped]: a genus of centipedes (see CENTIPEDE). SCOLOPEN'DRIUM, n. *-drĭ-ŭm*, a genus of ferns; the typical species is *S. vulgārĕ*, the common Hart's-tongue (q.v.) fern.

SCOLYTUS, *skŏl'ĭ-tŭs:* genus of coleopterous insects of family *Xylophagi:* see BARK BEETLE. One species, *S. destructor,* a beetle about one-sixth of an inch in length, of dull color, with short antennæ, thickened at the extremity, has destroyed great numbers of fine elms in the neighbor-

Scolytus destructor and Section of Wood, showing the burrows of the larvæ.

hood of London and elsewhere in England. The female insect burrows in the wood, and lays a row of eggs; the larvæ, as soon as hatched, begin to feed on the wood, and eat their way in long tunnels, diverging on all sides from the original one.

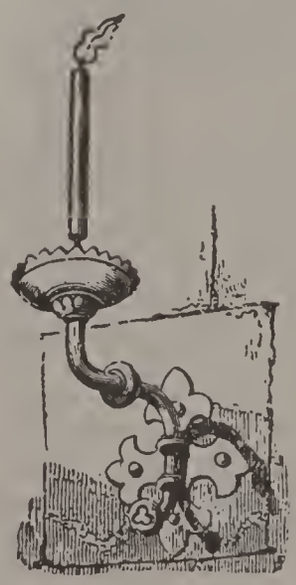
SCOMBERESOCIDÆ, *skŏm-bē-rĕ-sŏs'ĭ-dē:* family of fishes, of order *Physostomi.* The Flying-fish (*Exocœtus*) belongs to this family; also the Garfish (not the Amer. garpikes) and the Saury Pike. There is a series of keeled scales along each side of the belly; the dorsal fin is opposite the anal, on the caudal portion of the spinal column; the margin of the upper jaw formed by the intermaxillaries mesially and by the maxillaries laterally; the lower pharyngeals united into a single bone; and the stomach not distinct from the straight intestine, which has no appendages. The sub-families are the *Beloninæ,* garfish; *Scomberesocinæ,* mackerel-pikes, saury pikes; *Hemiramphinæ,* the half-beaks; and *Exocœtinæ,* flying-fish.

SCOMBRIDÆ, *skŏm'brĭ-dē,* or SCOMBERIDÆ, *skŏm-bĕr'ĭ-dē:* large family of acanthopterous fishes containing many species highly esteemed as food, and some of great value on account of the abundance in which they are caught. Some attain large size. They have a smooth body, covered generally with small scales, and often very beautifully colored; the tail-fin generally large, and the tail very muscular and powerful. The gill-covers have no armature. The sides of the tail are often keeled and armed with sharp-keeled scales. The front spines of the anal fin are generally detached, and sometimes those of the first dorsal fin. The second dorsal fin is often represented by numerous finlets, as in the Mackerel (q.v.). To the same tribe with the mackerel, characterized by finlets and by lack of armature on the lateral line, belong the Bonito (q.v.), the Tunny (q.v.), the Albacore (see TUNNY), and the Seirfish (q.v.). The importance of the Mackerel fishery is well known, also that of the Tunny fishery of the Mediterranean. The Sword-fish (q.v.) is an example of another group, com-

prising only a few species, having no finlets, and remarkably characterized by the dagger-like prolongation of the muzzle. The Pilot-fish (q.v.) belongs to a tribe having the first dorsal represented by isolated spines. There are other tribes or groups, some having the lateral line cuirassed, some not having this armature, and not having finlets nor detached spines. The Dory (q.v.) and allied genera, often regarded as forming a tribe of S., have been constituted into a distinct family, *Zeïdæ*.—The S. all are marine. They are more numerous in warm than in cold climates, though some are found in far northern seas, of which the mackerel is the most important instance.

SCOMBROIDES, *skŏm-broy'dez*, or SCOM'BEROIDS, n. plu. [L. *scomber;* Gr. *skombros*, species of tunny, mackerel, and Gr. *eidos*, resemblance]: genus of carangoid fishes; or family of fishes of which the common mackerel is taken as the type. SCOM'BROID, or SCOM'BEROID, a. *-oyd*, pertaining to the Scombroides.—See SCOMBRIDÆ.

SCONCE, n. *skŏns* [O.Dut. *schantse*, a rampart made of trees and branches: Ger. *schanze*, a sconce, a fort; *schanzen*, to make a fence, to fortify—probably derived from OF. *esconser*, to hide, to conceal—from L. *absconsus*, concealed, hid; *abscondĕrĕ*, to conceal (see ABSCOND)]: in *OE.*, small fort, detached from the main work, as for defense of a river or a pass: that which covers or resembles a cover; a screen: candlestick affixed to a wall, on a bracket; socket of a candlestick with a brim, in which the candle is inserted [OF. *esconse*, a dark lantern]: in *arch.*, a branch to support a candlestick; a helmet; the head or top of a thing: the head, in contempt. SCONCE, or ENSCONCE, v. to post one's self behind a screen of some kind.



Sconce.

SCONCHEON, n. *skŏn'shon* [etym. doubtful]: in *arch.*, the portion of the side of an aperture from the back of the jamb or reveal to the interior of the wall.

SCONE, *skôn:* parish in Perthshire, Scotland; on the left bank of the Tay, about two m. from Perth; famous as the seat of one of the most venerable of Scottish abbeys. S. is mentioned first in the beginning of the 10th c., when a council was held there in the 6th year of the reign of King Constantine; at which time it is styled, by the Chronicle which records the fact, *regalis civitas*, the royal city. A monastery was built at S. probably about the same period, and there was located the famous *scone-stone* on which the kings of the Scots were inaugurated, and which was carried by Edward I. of England to Westminster Abbey (see CORONATION). In the place of the ancient monastery, an abbey of Canons Regular was founded by Alexander I., 1115, and there the sovereigns continued to

be inaugurated and crowned. Alexander III., last of the ancient race of kings, and Robert Bruce, founder of the new dynasty, were crowned at S.; but after the accession of the House of Stuart, the coronations sometimes took place in other churches. In the summer of 1559, when Perth was held by the Lords of the Congregation, a disorderly multitude of their adherents assaulted the monastery of S., set it on fire, and left it a blackened ruin. The last coronation which was celebrated at S. was that of Charles II., 1651, Jan. 1. The abbey-church had never been restored, and the solemnity took place in the parish kirk, the crown being placed on the king's head by the Marquis of Argyle. 1716, Jan., the Jacobite leaders endeavored to encourage their followers by fixing a day for the coronation of the Chevalier at S., but the design was abandoned. In the reign of James VI., the abbey of S. was erected into a temporal lordship in favor of Sir David Murray, afterward Viscount of Stormont. The great chief-justice, the Earl of Mansfield, younger son of the fifth Viscount Stormont, was born at S.; and the Scottish peerage is now merged in the Brit. earldom of Mansfield. The Viscounts of Stormont had a residence near the site of the abbey, known as the Palace of Scone. The present palace was erected in the beginning of the 19th c. Pop. 1,483.

SCONE, or SCON, n. *skōn* [comp. Gael. *sgonn*, a block of wood, a lump, a cake]: in *Scot.*, a round or triangular flat piece of home-baked bread, prepared from wheaten or barley flour mixed with butter-milk and bicarbonate of soda—usually baked on a griddle.

SCOOP, n. *skôp* [O.Dut. *schoepe*, a shovel; *schoepen*, to draw water: Dan. *skuffe*, a shovel: Ger. *schüppe*, a scoop, a shovel; *schöpfen*, to draw water]: a hollow shovel or ladle; a hollow dish with a long handle for dipping among liquors; a surgical instrument; a coal-scuttle; in *OE.*, swoop: V. to hollow out; to excavate; to remove with a scoop. SCOOP'ING, imp. SCOOPED, pp. *skôpt*. SCOOP'ER, n. *-ér*, one who scoops; a tool used by engravers; the avocet. SCOOP-NET, a net so formed as to sweep the bed of a river.

SCOOT, v. *skôt* [prob. from *scout*]: *colloq.*, to run hastily; to scamper away.

SCOPAS, *skō'pas:* Greek sculptor and architect, of the later Attic school, whose head was Praxiteles (q.v.): b. in the island of Paros, and lived during the first half of B.C. 4th c. Nothing is known of his life or the date of his death. His principal architectural works are: 'The Temple of Athena Alla at Tegea,' the first in size and beauty in the Peloponnesus: 'The (second) Temple of Diana at Ephesus' (though Deinocrates also and even more generally is named as the architect); some of the bas-reliefs in the famous Mausoleum erected by Artemisia, Queen of Caria, in memory of her husband (and now in the Brit. Museum). S.'s sculptures, by which we mean his single statues and groups illustrating the divinities of Greek mythology, were very numerous, and mostly in marble: they embrace

subjects from the myths of Aphrodite (Venus), Dionysus (Bacchus), Apollo, Artemis (Diana), etc. But perhaps the noblest, and certainly the most famous sculpture by S., was that which latterly stood in the Flaminian Circus at Rome, and represented Achilles conducted to the island of Leuce by the divinities of the sea. It included statues of Neptune, Thetis, the Nereids, Tritons, and a variety of sea-monsters, and, according to Pliny, the whole was so beautiful that it alone would have immortalized Scopas.

SCOPE, n. *skōp* [Gr. *skopos*, a watcher, a mark or aim—from Gr. *skeptomai*, I view or survey: It. *scopo*, aim, scope] space; room; the limit of intellectual view; the end or ultimate object toward which the mind is directed; the intention; the aim or drift; unrestricted liberty; in *OE.*, act of riot; sally.—SYN.: aim; intention; drift; mark; end: room; space; liberty; freedom; license; extent; sweep.

SCOPEL'IDÆ: see SALMONIDÆ.

SCOPIFEROUS, a. *skō-pĭf'ĕr-ŭs* [L. *scopa*, a brush; *fero*, I bear]: furnished with one or more dense brushes of hair.

SCOPIFORM, a. *skŏp'ĭ-fawrm* [L. *scopæ*, a broom or besom made of twigs; *forma*, shape]: having the form of a broom or besom. SCOP'IPED, n. *-pĕd* [L. *pes* or *pedem*, a foot]: one of a tribe of insects that have a brush of hairs on the hind feet.

SCORBUTIC, a. *skŏr-bū'tĭk*, or SCORBU'TICAL, a. *tĭ-kăl* [mid. L. *scorbūtus*, the scurvy: Low Ger. *schorbock;* Ger *scharbock*, the scurvy: F. *scorbutique*, scorbutic]: affected with the scurvy, or subject to it; resembling the scurvy. SCORBU'TICALLY, ad. *-lĭ*. SCORBUTUS, n. *skŏr-bū'tŭs*, a disease characterized by extreme debility, swollen gums, and purple spots on the skin, induced by privation and malnutrition, often from the want of vegetables; scurvy.

SCORCH, v. *skŏrch* [OF. *escorcher*—from mid. L. *excorticārĕ*, to flay—from L. *ex*, off; *cortex* or *cortĭcem*, bark, rind: comp. Low Ger. *schroggen;* Dut. *schroken*, to scorch, to singe]: to burn superficially; to affect painfully with heat: to be parched or dried up; to singe. SCORCH'ING, imp. ADJ. parching; burning. SCORCHED, pp. *skŏrcht*. SCORCHINGLY, ad. *-lĭ*.

SCORDIUM, n. *skŏr'dĭ-ŭm* [Gr. *skordion*, a plant that smells like garlic]: a plant, the water-germander; the *Teucrĭum scordĭum*, ord. *Labĭātæ*.

SCORE, n. *skōr* [Icel. *skora*, a score: AS. *sceran;* Dut. *scheren*, to shear or cut: Dan. *skure;* Dut. *schore*, a notch or score]: a scratch, notch or mark used to indicate a number; a line drawn; an account or reckoning kept by marking in notches or lines; a tally-mark; the number 20, as being marked off by a notch; an account run up; reason or motive; the complete transcript of a musical composition (see below): in *OE.*, debt imputed: V. to scratch or mark as with chalk to indicate a number or numbers; to mark by notches or lines; to set down, as a debt. SCOR'ING, imp. SCORED, pp. *skōrd*. IN SCORE, in *music*, all the parts of a composition arranged to meet the eye at once—so called

from the bar drawn through all its parts in its early use (see SCORE, below). TO QUIT SCORES, to settle or balance accounts; to give satisfaction. SCOR'ER, n. *-ér*, an instrument for marking numbers on timber trees. LONG SCORE, a heavy debt or reckoning. SHORT SCORE, a light debt, or one easily discharged.—SYN. of 'score, n.': notch; line; twenty; account; tally; reason; motive; sake; account; incision.

SCORE, in Music: composition for several voices or instruments, or for an orchestra, so written that each part has a separate staff for itself, these staves being placed over each other, bar corresponding to bar. It is so called because the bars are *scored* or drawn through all the parts from top to bottom. Occasionally, where there is deficiency of staves for all the parts, or where any of the parts have so little to do that it is not necessary to assign them a separate staff, parts related to or connected with each other, e.g., two flutes, two clarionets, or three trombones, may be written together on the same staff. The arrangement or the distribution of the parts in a S. is of some importance. As a general rule, the highest part should be uppermost, then the next lower, and gradually descending. All the parts of a chorus should be placed together. Perfection in reading S. is not very easily attained, but is necessary for a thoroughly trained musician. The student of music who can read or play the great master works from the S. will become far more intimately acquainted with them than he could by mere pianoforte arrangements, and will come to understand the means by which their composers have produced their wonderful effects. The use of so large a number of clefs, and the practice which has obtained of writing parts for particular instruments in other keys, have added greatly to the difficulty of studying the S. Among various suggestions for simplifying the S., one, advocated in Brown's *Elements of Musical Science*, consists in the use of but one clef, the bass or F clef; the other parts being distinguished from the bass by short bars attached to the clef, which direct the performer to take the notes one, two, or three octaves higher.

SCORESBY, *skōrz'bĭ*, WILLIAM, D.D.: renowned English Arctic explorer and savant: 1789, Oct. 5—1857, Mar. 21; b. Whitby, Yorkshire; son of William S. (1760–1829), who was the most distinguished Arctic whale-fisher of his time. Young S. began a seafaring life at the age of 11; and in his 21st year succeeded his father as commander of the *Resolution*, and in the business of whale-fishing. After 17 voyages to the Spitzbergen and Greenland whaling-grounds, he published the results of his observations of the countries within the Arctic Circle in *An Account of the Arctic Regions* (2 vols. 1820), a work which added largely to the sciences of meteorology, hydrography, and nat. history. In 1822 he explored the e. coast of Greenland, a tract before unknown, and published at Edinburgh, 1823, an account of this expedition. In 1824 he was elected a fellow of the Royal Soc. of London, and later was chosen *correspondant* of the French Institute. Returning from an

expedition, 1822, and finding his wife dead, he proceeded to give effect to a desire which he had long had, of becoming an authorized teacher of religion. He entered at Queen's College, Cambridge; graduated B.D. 1834, receiving 1839 the degree D.D., and labored faithfully at Liverpool and afterward at Bradford, till failing health compelled him to retire to Torquay. He continued his physical researches, giving special attention to terrestrial magnetism, especially in its relation to navigation; and published the results, many of which were of great value and interest, in the *Philosophical Transactions*, the *Transactions of the Royal Soc. of Edinburgh*, the *Reports of the British Assoc.*, and subsequently in improved form in his *Magnetical Investigations* (Lond. 2 vols. 1839–52). For better prosecution of these researches, he made a voyage to the United States 1847, and to Australia 1853, returning 1856, enfeebled in health by his arduous labors. He died at Torquay. Besides his work on *Zoistic Magnetism*, which described a series of researches undertaken to elicit some natural connection between magnetic and mesmeric agencies, he published various religious works. He interested himself much in social questions.—S. was a man of simple, cheerful piety, and of frank and amiable disposition. See *Life*, by his nephew, Dr. R. E. Scoresby-Jackson (Lond. 1861).

SCORIA, n. *skō'rĭ-ă*, SCO'RIÆ, n. plu. *-rĭ-ē* [L. *scōrĭa;* Gr. *skōrĭa*, dross, slag—from Gr. *skōr*, dung: It. *scoria:* F. *scorie*]: the scum, dross, or slag left from melted metals or ores; rejected matter: in *geol.*, the accumulations of dust, ashes, cinders, and loose fragments of rocks, discharged from active volcanoes; more or less porous from expansion of the gases contained in the melted material: see VOLCANIC ROCKS. SCO'RIA'CEOUS, a. *-ā'shŭs*, pertaining to or resembling dross; drossy; in *geol.*, applied to loose cindery débris having the aspect or character of scoriæ. SCO'RIFORM, a. *-fawrm* [L. *forma*, shape]: dross-like; cindery; in *geol.*, applied to loose cindery accumulations which seem to owe their origin to igneous action.

SCORIFY, v. *skō'rĭ-fī* [F. *scorifier*, to reduce to dross—from L. *scōrĭa*, dross; *facĭō*, I make]: to reduce to scoria or dross. SCO'RIFYING, imp. SCO'RIFIED, pp. *-fīd:* ADJ. reduced to scoriæ or cindery dross. SCO'RIFICA'TION, n. *-fĭ-kā'shŭn*, the operation of reducing a metal wholly or partially to scoria or dross. SCORIFIER, n. *skō'rĭ-fī-ĕr*, in *assaying*, a saucer of refractory clay for containing a charge of lead and the metal to be assayed.

SCORN, n. *skŏrn* [OF. *escarn;* Sp. *escarnio;* It. *scherno*, derision, mockery: It. *schernire;* OF. *escarnir*, to mock: Icel. *skarn*, ordure, dirt: AS. *scearn*, dung—the primary meaning seeming to be, to treat one as dirt]: extreme contempt; the expression of disdain or contempt in look, gesture, or words, called forth by a sense of the meanness, baseness, or utter insignificance of the object of it, and by a belief in one's own superiority: V. to think or treat as unworthy or contemptible; to hold in extreme contempt; to despise or contemn; in *OE.*, to neglect; to disregard

SCORN'ING, imp. : N. the act of contemning or despising; the act of treating with contempt or disdain. SCORNED, pp. *skŏrnd.* SCORNER, n. *skŏrn'ĕr*, one who scorns; one who scoffs at religion. SCORN'FUL, a. *-fŭl*, contemptuous; disdainful. SCORN'FULLY, ad. *-lĭ*, contemptuously; insolently. SCORN'FULNESS, n. *-nĕs*, the quality of being scornful. TO LAUGH TO SCORN, to make a mock of; to deride. TO THINK SCORN, in *OE.*, to hold unworthy of regard; to disdain.—SYN. of 'scorn, v.': to despise; slight; revile; contemn; vilify; neglect; disregard; disdain;—of 'scorn, n.': derision; contumely; despite; dishonor; contempt reproach; insolence.

SCORPÆNA, *skawr-pē'na:* genus of fishes, of family *Mailed Cheeks* (q.v.). The head is large and compressed, more or less armed with spines or tubercles. The body is of somewhat perch-like form. Some of the *Scorpænæ* are remarkable for ugliness; some exhibit very fine colors. They are numerous in the Mediterranean, and widely distributed in the seas of warm climates. They frequent rocky shores in shoals, and feed on crustaceans, small fishes, etc. They are popularly called *Hog-fish* and *Scorpion-fish.* The flesh is dry and tasteless, but the liver yields a useful oil.—The Bergylt (q.v.) belongs to a nearly allied genus.

SCORPIO, n. *skŏr'pĭ-ō* [L. *scorpio;* Gr. *skorpĭōn*, a scorpion]: the Scorpion, a sign of the zodiac: in *astrol.*, the 'accursed constellation,' the 'false sign,' ominous of war, discord, and woe. SCOR'PION, n. *-ŏn*, animal shaped like a lobster, and having a very venomous sting in its tail (see below: in *Scrip.*, a sort of scourge with leaden pellets and knots on its cords. SCORPION-FLY, an insect having a tail resembling that of the scorpion. SCORPION-GRASS, the *Myosōtis*, ord. *Boraginācĕæ.* SCORPION'S-TAIL, a plant having trailing herbaceous stalks, and producing a pod resembling a caterpillar; the *Scorpiūrus sulcātus*, ord. *Leguminōsæ.*

SCORPIOID, a. *skŏr'pĭ-oyd*, or SCOR'PIOID'AL, a. *-oyd'-ăl* [Gr. *skorpĭōn*, a scorpion; *eidos*, resemblance]: in *bot.*, rolled in a circinate manner, or resembling the tail of a scorpion; having a peculiar twisted cymose inflorescence, as in *Boraginācĕæ.* SCORPIOID CYME, flowers arranged alternately, or in a double row, along one side of a false axis, the bracts forming a double row on the other side.

SCORPION, *skawr'pĭ-on* (*Scorpio*): genus of *Arachnida* of order *Pulmonaria*, formerly including the whole family *Scorpionidæ*, to all of which the popular name is still extended. Scorpions are natives of warm climates, both in the e. and in the w. hemispheres. The species are numerous. They have the body elongated, and no marked division between the thorax and abdomen. Six segments of the abdomen are broad; but the last six are narrow, forming a tail; and the last segment is modified into a curved and sharp sting, having two pores on its lower side, from which the venom flows, supplied by two poison glands in the base of the segment. The palpi are modified into pincers or claws like those of the lobster, by means of which

.ey is seized. There are four spiracles or breathing-pores on each side of the abdomen. There are two remarkable comb-like appendages on the under surface of the thorax, of unknown use. The number of eyes is various; in the restricted genus *Scorpio*, of which the COMMON S. (*S. Europæus*) of s. Europe is an example, there are only six; but in

Scorpion (*Scorpio Europæus*).

some of the genera eight and twelve. Scorpions feed on beetles and other insects; and after seizing them, pierce them with the sting before eating them. They also eat the eggs of spiders, etc. They lurk under stones and in holes and crevices, but come forth to seek their prey, running with great activity. In running, they carry the tail curled over the back. When alarmed or irritated, they show great fierceness, evidently aware of the power of their sting, and moving it in all directions, as if threatening an adversary. They are universally dreaded, being apt to enter houses and beds, hiding themselves under pillows, in shoes, boots, etc.; so that accidents from their sting are very frequent in countries where they abound. The sting is seldom fatal; but even that of the Common European S. is very painful; and that of some of the largest species—six inches long—is much more severe, attended with much nausea and constitutional derangement; and its evil effects do not soon cease. It is of use to press a large key or other tube on the wound, to force out part of the poison. The best remedy is ammonia, internally administered, also applied externally.

The female S. shows great regard for her young, which she carries for some time clinging in great numbers to her back, limbs, and tail.

Thirteen species in the s.w. United States have been described, e.g., *S. Allenii* and other species in s. Cal., *Buthus spinigerus* in Texas, and *B. Carolinianus* in all the southern states.

SCORSE, or SCOURSE, v. *skŏrs* [OF. *couratier*, *couracier*, a broker]: in *OE.*, to exchange; to choose; to drive; to deal for the purchase of horses: N. change; exchange. SCORS'ING, imp. SCORSED, pp. *skŏrst*

SCORZONERA, n. *skŏr'zŏ-nē'rŭ* [Sp. *escorzonera*, viper's grass; *escorzon*, a toad: It. *scorzonera*]: genus of plants of nat. order *Compositæ*, sub-order *Cichoraceæ*, having yellow or, rarely, rose-colored flowers. The species are numerous, mostly natives of s. Europe and the East: some have been popularly supposed to be a remedy for the bites of vipers. The Common S., *S. Hispanica*, native of s. Europe, has long been cultivated for its esculent roots. The root is black externally, white within, about the thickness of a man's finger, long, and tapering very gradually, whence the name *Viper's Grass*, sometimes given to the plant, the root being supposed to resemble a viper. It contains a white milky juice, and has a mild, sweetish, mucilaginous taste: it is pleasant food when boiled; the outer rind being first scraped off, and the root steeped in water, to abstract part of its bitterness. The leaves are an inferior substitute for mulberry leaves in feeding silk-worms.—Other species of S. are used similarly.

SCOT, n. *skŏt* [AS. *Scottas*, the Scotch, the Irish: L. *Scoti*, the Scots]: a native of Scotland. SCOTCH, n. *skŏch*, the inhabitants of Scotland; their language: ADJ. pertaining to Scotland, its language, or its people. SCOTCH MAN, n. a native of Scotland. SCOTS, a. *skŏts*, same as *Scotch*. SCOTS'-MAN, n. same as *Scotchman*. SCOTTICISM, n. *skŏt'ĭ-sĭzm*, an idiom or expression peculiar to the natives of Scotland. SCOT'TISH, a. *-ĭsh*, pertaining to Scotland, its language, or its inhabitants. SCOTCH GUARDS IN FRANCE (see FRENCH SCOTS GUARD). SCOTCH MIST, a dense, mist-like, fine rain. SCOTCH THISTLE, a variety of thistle—so called from its being the national emblem of Scotland; the *Onopordon acanthium*, ord. *Compositæ*, sub-ord. *Cynarocephalæ*. SCOTTICE, ad. *skŏt'ĭ-sē* [L.]: after the Scotch manner or fashion, in the Scotch language.

SCOT, *skŏt*, MICHAEL: philosopher and 'magician.' Of the time and place of his birth nothing is certainly known; probably he was native of Scotland and lived in the 13th c. Oxford, Paris, Toledo, claim him as *alumnus* of their schools. He knew of Arabic enough to read Avicenna and Averroes in the originals, and Aristotle in Arabic versions: many of these writings he translated into Latin. His own writings treat of astrology, alchemy, and occult arts; and were highly esteemed by scholars of his own and later generations. His works *Super Auctorem Sphæræ; De Sole et Luna; Theatrum Chimicum; De Chiromantia; De Physiognomia et de Hominis Procreatione*, were repeatedly printed; the rest of his writings are in MSS. S. was reputed a great magician, having demons at his command to transport him in an instant across seas, to fetch from the ends of the earth meat and drink for the good cheer of his friends, etc.

SCOT, REGINALD: writer who has acquired honorable reputation as an early disbeliever in the reality of witchcraft: about 1538–99; b. near Smeeth, Kent, England; son of Richard S., who was third son of Sir John Scot of Scotshall. He studied at Oxford; and seems to have applied himself through life to learned pursuits. His remarkable work, *The Discoverie of Witchcraft* (1584), is designed to demonstrate the absurdity of the prevalent belief on the subject. His thesis is: 'There will be found among our *Witches* only *two sorts;* the *one sort* being such by imputation, as so thought of by others (and these are abused and not abusers), the *other* by *acceptation*, as being *willing* so to be *accounted*, and these be mere *Coseners.*' His book is full of learning, furnishing a great mass of valuable details on the whole subject; and is marked by sound sense and humane feeling, qualities that naturally excited the antipathy of King James I., who wrote his *Dæmonology* in reply. But the 'British Solomon' only reflected the general superstition of his age, and S. had to run the gantlet of a series of 'Answers' and 'Refutations' by a number of eminent men. His book was ordered to be burned by the common hangman, and copies of it are now extremely rare. Besides *The Discoverie of Witchcraft*, S. wrote *A Perfect Platform of a Hop Garden*, which gave origin to hop-culture in England.

SCOT, n. *skŏt*, or SHOT, n. *shŏt* [AS. *sceotan*, to shoot, to throw down in payment; *scot*, payment: OF. *escot*, payment of one's own share of a common expense: It. *scotto*, the reckoning at an inn: Icel. *skot*, a shot, contribution: Low Ger. *scheten*, to cast; *schott*, contribution: comp. Gael. *sgot*, part, share]: the reckoning; the bill; an assessed tax laid on according to ability to pay. SCOT AND LOT, *lit.*, contribution and share; in English boroughs, all parochial assessments according to ability: formerly, in many boroughs, the right of voting was restricted to scot and lot payers. SCOT-FREE, without payment; unhurt: see also SCAT.

SCOTCH, v. *skŏch* [probably only a corruption of *scutch*, to bruise flax: Norw. *skoka*, *skuku*, a swingle for beating flax]: to lash; to scutch; to cut or wound slightly: N. a slight cut or shallow incision; a line drawn on the ground, as in hop-*scotch*. SCOTCH'ING, imp. SCOTCHED, pp. *skŏcht*: ADJ. cut with shallow incisions. SCOTCH or SCOTCHED COLLOPS, beef cut into small pieces; scored or partially cut collops.

SCOTCH, v. *skŏch* [Wal. *ascot*, anything used to support an unsteady object; *ascoter*, to prop: F. *accoter*, to underprop: Lang. *acouta*, to support]: to shoulder up; to prop; to stop, as a wheel, by putting a piece of stone or wood under it: N. a drag or break applied to the wheel of a carriage in descending a declivity. SCOTCH'ING, imp. SCOTCHED, pp. *skŏcht*. Also spelled SCOAT and SCOTE.

SCOTCH STATUTES generally, the ancient acts of parliament from the reign of James I. of Scotland to the Union of England and Scotland: also many statutes since that date applicable exclusively to Scotland. While in Scotland the old statutes lost their force by desuetude, in England a statute, however ancient and however neglected, continues law until it is expressly, or by strong implication, repealed by subsequent statute.

SCOTE: see SCOTCH 2.

SCOTER, n. *skō'tĕr* (*Œdemia*): genus of the oceanic section of ducks, of the sub-family *Fuligulinæ*, having a short broad bill with elevated knob at the base of the upper mandible, tip much flattened and terminated by a large flat nail, mandibles laminated with broad strong widely separated plates; wings of moderate length; tail short and acute; feet very large; plumage generally very dark. Their food is chiefly marine shell-fish, crustaceans, etc., which they obtain by diving.—The

Velvet Scoter (*Œdemia fusca*).

COMMON S., or BLACK S. (*Œ. nigra*), is about the size of the common duck. The whole plumage of the male is deep black; the bill and legs are black, except a line of orange along the ridge of the upper mandible. The female is dark brown. The flesh is oily, and has a fishy taste; but, being therefore permitted to Rom. Catholics during Lent, is in great request in some countries.—The similar Amer. species is *Œ. Americana;* and the name is applied to *Œ. fusca*, the velvet or white-winged S., and *Œ. perspicillata*, the surf S., also called sea-coots.

SCOTIA, n. *skō'shĭ-ă:* a poetic name for *Scotland.*

SCOTIA, n. *skō'tĭ-ă* [Gr. *skŏtĭa*, darkness]: the hollow molding in the base of a column—so called from the shadow formed by it: see MOLDINGS.

SCOTIST, n. *skō'tĭst:* follower of Duns *Scotus*, celebrated scholastic philosopher of the 14th c.: see DUNS SCOTUS.

SCOTLAND, *skŏt'land:* northern section of the island of Great Britain; member of the United Kingdom of Great Britain and Ireland.

For the *Geography*, see GREAT BRITAIN.

History.—The early inhabitants of the country were Picts (q.v.). The original Scotia or S. was Ireland: and the Scoti or Scots, at their first appearance in authentic history, were the people of Ireland. The Scots were a Celtic race, and their original seat in n. Britain was in Argyle, which they acquired by colonization or conquest, before the end of the 5th c., and whence they spread along the w. coast from the Firth of Clyde to the modern Ross. The name S. seems first to have been given to the united kingdom of the Picts and Scots in the 10th c. It was then sometimes styled, by way of distinction, *Scotia Nova* (New Scotland), and it was a considerable time afterward before the name S. was applied to it to the exclusion of Ireland. This interchange of names was a fruitful source of dispute between Irish and Scottish writers in the 16th and following centuries, and even now the controversy is hardly at an end.

The first prince of the British Scots mentioned in authentic annals was Fergus, son of Erc, who crossed over to Britain about 503. His nation had been converted to Christianity by St. Patrick, and Fergus himself is said to have received the blessing of the saint in his early years.—His great-grandson, Conal, was king of the British Scots when Columba (q.v.) began the conversion of the northern Picts; and by that prince, according to the best authorities, Iona was given for the use of the mission.—Conal was succeeded by his nephew, Aidan, who was inaugurated as sovereign by St. Columba in the island of Iona—a ceremony which Scottish writers, misled by the great French antiquary, Martène, long believed to be the first example of the benediction of kings. Aidan was a powerful prince, and more than once successfully invaded the English border; but toward the end of his reign he received a severe defeat from the Northumbrian sovereign Ethelfrid at the battle of Degsestan.

The history of Aidan's successors is obscure and uninteresting, except to special students. Their kingdom was overshadowed by the more powerful monarchy of the Picts, with which, as well as with its neighbors in the south—the Britons of Cumbria—it was in almost unceasing conflict. The Scots were for a time under some subjection to the English of Northumbria, but recovered their independence on the defeat and death of King Egfrid in battle with the Picts at Nechtansmere 685. In the middle of the 9th c., by a revolution whose nature is unknown, the Scots acquired predominance in n. Britain.—Kenneth, son of Alpin, lineal descendant of Fergus and Aidan, succeeded his father as king of the Scots 836. The Pictish kingdom was weakened by civil dissension and a disputed claim to the crown. Kenneth laid claim to it as the true heir in the female line, and was acknowledged king 843.

King Kenneth transferred his residence to Forteviot in

FINGALS CAVE.

Stratherne, which had been the Pictish capital, fixing soon afterward the ecclesiastical metropolis of the united kingdom at Dunkeld, where he built a church dedicated to St. Columba. The Picts and Scots, each speaking a dialect of the Celtic, gradually coalesced into one people, whose territory extended from the Firths of Forth and Clyde to the n. extremity of Britain. The crown descended to a line of princes of the family of Kenneth, whose rule gave unity and comparative tranquillity to the Scots of Britain, which those of Ireland, at no time really united under one prince, never possessed. The first interruption to the descent of the crown in the line of Kenneth was the reign of a usurper named Grig, round whose name, amplified to Gregory by the writers of a later age, a cloud of legendary fiction gathered. The old family was restored on his expulsion 893.

The reign of Constantine (reigned 904–953), son of Aodh, was remarkable. In his time it is probable that the seat of the ecclesiastical primacy was transferred from Dunkeld to St. Andrews, and that the regal residence was fixed at Scone. At the latter place, in the sixth year of his reign, the chronicles mention that Constantine the king, Kellach the bishop, and the Scots, swore to observe the laws and discipline of the faith and the rights of the churches and the gospels. This seems to indicate the meeting of some sort of council, civil or ecclesiastical, or more probably a combination of both, according to the form prevalent at this period among the Celtic and the Teutonic nations. Even before the establishment of the kingdom of the Picts and Scots in the person of Kenneth, n. Britain had experienced the attacks of a new enemy, the Scandinavian invaders, generally spoken of as Danes. Constantine resisted them bravely, but toward the end of his reign he entered into alliance with them in opposition to the English. A powerful army of Scots and Picts, Britons and Danes, disembarked on the Humber, and was encountered at Brunanburgh by Athelstane, King of England. A battle there was the first of a series of unfortunate combats by Scottish princes on English ground. The confederate army was defeated, and though Constantine escaped, his son was among the slain. Weary of strife, the king retired to the Culdee monastery at St. Andrews, of which he became abbot, and where he died 953

During the reign of Malcolm, the first of that name, successor of Constantine, a portion of the Cumbrian kingdom, including the modern Cumberland and part of Westmoreland, which had been wrested from the Britons by Edmund, King of England, was bestowed by Edmund on the Scottish sovereign. This grant was the foundation of that claim of homage made by the English kings on the Scottish sovereigns, which afterward became the cause or the pretext for the great struggle between the two nations. The n. kingdom was further increased in the reign of Kenneth, son of Malcolm, by the acquisition of Lothian, and of n. Cumbria, or Strathclyde. Lothian, formerly a part of the Northumbrian kingdom, and entirely English in

its population, was bestowed on Kenneth by Edgar King of England. The Cumbrian kingdom, which had at one time extended along the w. coast from the Firth of Clyde to the border of Wales, had been weakened by the loss of its s. territories; and it now fell under the dominion of the Scottish king. The last addition to Scotland in the south was under Malcolm II. (reigned 1003–33), son of Kenneth, who acquired the Merse and Teviotdale from the Earl of Northumbria, and thus advanced his kingdom on the e. border to the Tweed. The kings who immediately followed are better known to the general reader than any of their predecessors, poetry having made their names familiar to every one.—Malcolm's successor was his grandson Duncan, whose brief reign was followed by that of Macbeth (q.v.). The latter was a vigorous and prudent ruler, munificent to the church, and famous as *the* only Scottish king who made a pilgrimage to Rome. But though by marriage he was connected with the royal line, he was unable to secure the affection of his subjects. Malcolm, eldest son of Duncan, assisted by his kinsman Siward, Earl of Northumbria, invaded Scotland. The usurper was defeated and slain at Lumphanan, in Mar (1056), and Malcolm III. was acknowledged as king.

The long reign of Malcolm III. (1056–93) was the commencement of a great social and political revolution in Scotland. His residence in England, and still more his marriage with the English Princess Margaret, sister of Edgar Atheling, led to the introduction of English customs, the English language, and an English population into the n. and w. districts of the kingdom, which hitherto had been inhabited mostly by a Celtic race. The influx of English colonists was increased by the tyranny of William the Conqueror and his Norman followers. All received ready welcome from the Scottish king, whose object it was to assimilate the condition of the Scots in every respect to that of their fellow-subjects in Lothian; and what his stern, though generous, character might have failed to accomplish, was brought about by the winning gentleness and Christian graces of his English queen.

Malcolm fell in battle before Alnwick Castle 1093, and Margaret survived only a few days: the work of their reign seemed about to be utterly overthrown. The Celtic people of Scotland, attached to their old customs, and disregarding the claims of Malcolm's children, raised his brother, Donald Bane, to the throne. The success of this attempt to restore a barbarism which the better part of the nation had outgrown was brief; Donald was dethroned, and Edgar, eldest surviving son of Malcolm and Margaret, was acknowledged as king. The very name of the new sovereign marked the ascendency of English influence. That influence, and all its beneficial effects, increased during the reigns of Edgar and his brother and successor, Alexander I.—The change went steadily on under the wise and beneficent rule of David I. (q.v.), youngest son of Malcolm. His reign (1124–53) was devoted to the task of ameliorating the condition of his subjects, which was

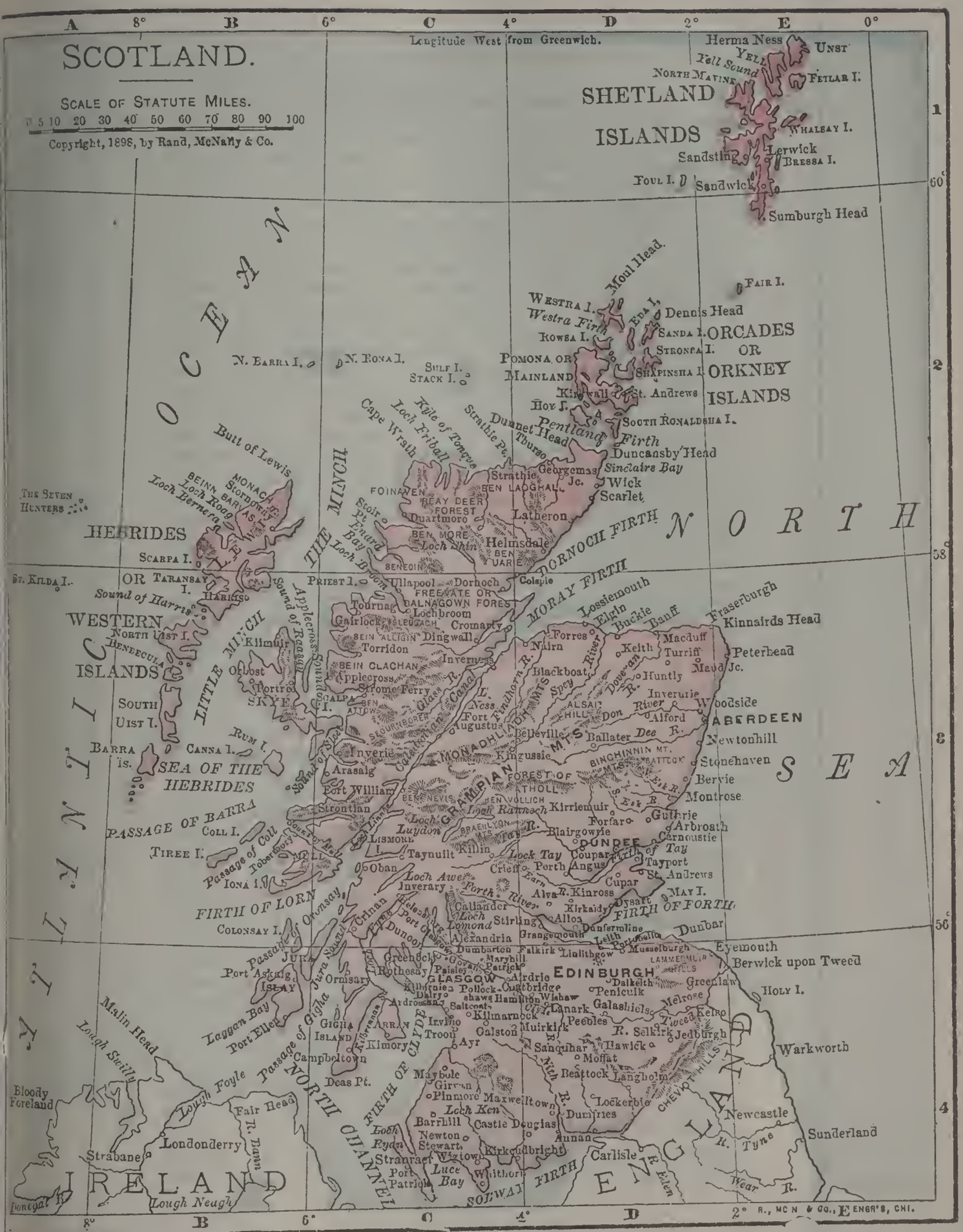
nobly accomplished. David was the model of a Christian king. Pious, generous, and humane, he was at the same time active and just, conforming himself to the principles of religion and the rules of the church, but never forgetting that to him, not to the clergy, God had committed the government of his kingdom. He was all that Alfred was to England. Had he reigned over a more powerful nation, his name would have been one of the best known of the princes of Christendom. At his accession, Scotland was still but partially civilized, and it depended in a great measure on the character of its ruler whether it was to advance or recede. It received a permanent stamp from the government of David. The Celtic people were improved morally, socially, and ecclesiastically; and all along the e. coast were planted Norman, English, and Flemish colonies, which gradually penetrated into the inland districts, and established the language and manners of that Teutonic race which forms the population of the greater part of Scotland. David encouraged and secured the new institutions by gradually superseding the old Celtic traditionary usages by a system of written law: thus the first genuine collections of Scottish legislation belong to his reign. David was as great a reformer in the church as in the state. The ecclesiastical system prevalent in Scotland almost till his time differed in some points from that in England and on the continent, bearing a great resemblance to that of Ireland, from which it was indeed derived. David established dioceses, encouraged the erection and endowment of parishes, provided for maintenance of the clergy by tithes, and, displacing the old Celtic monastic bodies, introduced the Benedictine and Augustinian orders.

David did not forget duties of a less agreeable kind. He knew that a Scottish king really held his crown by tenure of the sword; and none of his fierce ancestors was a more intrepid warrior than the accomplished and saintly David. His skill and courage were shown, though without success, at the Battle of the Standard. As the representative through his mother of the ancient kings of England, he had many friends in that country; and had the Scottish army been successful, the history of the two kingdoms might have been different. As it was, he contented himself with maintaining the cause of his sister's child, Empress Matilda, against King Stephen.

David's grandson and successor, Malcolm IV., reigned 12 years (1153–65), and the next king was William the Lion, Malcolm's brother (reigned 1165–1214). These princes pursued the policy of their grandfather with equal resolution, though sometimes with less success. They were embarrassed by their connection with the English King Henry II., who took advantage of his superior power and ability to impose unwise and unjust restraints on the independence of the Scottish sovereigns and their kingdom —a policy which laid the foundation of the unhappy national strife of after years. This was averted for a time by the concessions of Richard I. 1189. 'For more than a

century,' says Lord Hailes, 'there was no national quarrel, no national war between the two kingdoms—a blessed period.' That period was well employed by the next two kings, Alexander II. and Alexander III., son and grandson of William the Lion, to consolidate the institutions of their kingdom, and extend and confirm what had been begun by David. Alexander III. was one of the ablest and best of the Scottish kings. By a treaty with the king of Norway, he added to his kingdom Man and the other islands of the Western Sea, held by the Norwegians. His sudden death, 1286, was one of the greatest of calamities: it closed a period of prosperity and improvement such as the kingdom did not again enjoy for nearly 500 years. The history of this interesting period has yet to be written. The only modern account of any value is in the accurate but meagre Annals of Lord Hailes. Tytler begins his History with the reign of Alexander III.; and Robertson, in his narrative of two reigns—in popular language called the History of Scotland, as Lord Macaulay's similar work is called the History of England—speaks of what took place during the whole time from the union with the Picts to the death of Alexander III. as 'events which may be slightly touched, but merit no particular or laborious inquiry.'

On the death of the infant granddaughter and heiress of Alexander III., 1290, the succession to the crown was disputed. The question between the two chief claimants, Baliol and Bruce (q.v.), was not free from doubt, according to the customs of the time; and Edward I. of England, to whom the decision was referred, appears at first to have acted with good faith. But this great king, who had already subdued Wales, was now bent on uniting the British Islands under one sceptre; and in the pursuit of that object he sacrificed humanity, honor, and justice. The results were deplorable. The national spirit of the Scots was finally roused, and after a long struggle, under Wallace and Bruce, they secured their independence on the field of Bannockburn (q.v.). The battle of freedom was won, but at the expense of tranquillity and civilization. The border counties were continually wasted by the English; the central provinces were the scene of frequent warfare among the chief nobles; and the highland districts became more and more the seat of barbarism, the Celtic tribes reacquiring something of their old ascendency, as they did in Ireland in the troubled times which followed the invasion of Edward Bruce. The strong arm of King Robert might have repressed these disorders, had his life been longer spared after the treaty of Northampton; but his death, and the accession of an infant son, again plunged the country into all the miseries of foreign and civil war. When that son, David II., grew up to manhood, he proved in every respect unworthy of his great father. His reign, and that of his successors, Robert II. and Robert III., the two being the first princes of the House of Stewart, were the most wretched period of Scottish history. In 1411 half of the kingdom would have


SCOTLAND.
SCALE OF STATUTE MILES.
0 5 10 20 30 40 50 60 70 80 90 100
Copyright, 1898, by Rand, McNally & Co.
Longitude West from Greenwich.
SHETLAND ISLANDS
Herma Ness
Unst
Yell
Yell Sound
North Mavine
Fetlar I.
Whalsay I.
Lerwick
Bressa I.
Sandstin
Foul I.
Sandwick
Sumburgh Head
Moul Head
Fair I.
Westra I.
Westra Firth
Eda I.
Dennis Head
Rowsa I.
Sanda I.
ORCADES OR ORKNEY ISLANDS
Stronsa I.
Shapinsha I.
Pomona or Mainland
Kirkwall
St. Andrews
Hoy I.
South Ronaldsha I.
Pentland Firth
Duncansby Head
Sinclairs Bay
Wick
Scarlet
Dunnet Head
Thurso
Strathie Pt.
Georgemas Jc.
Strathie
Ben Laoghal
Kyle of Tongue
Loch Eriball
Cape Wrath
Stoir Pt.
Foinaven
Reay Deer Forest
Duartmoro
Ben More
Loch Shin
Latheron
Helmsdale
Ben Uare
Ben Eighe
Loch Broom
Dornoch Firth
Moray Firth
Colsie
Lossiemouth
Elgin
Buckie
Banff
Fraserburgh
Kinnairds Head
Peterhead
Maud Jc.
Macduff
Turriff
Keith
Huntly
Inverurie
Woodside
Aberdeen
Newtonhill
Stonehaven
Bervie
Montrose
Gulrie
Arbroath
Carnoustie
Forfar
Kirriemuir
Blairgowrie
Dundee
Firth of Tay
Tayport
St. Andrews
May I.
Firth of Forth
Dunbar
Eyemouth
Berwick upon Tweed
Holy I.
Warkworth
Newcastle
Sunderland
Tyne R.
Wear R.
Tweed R.
Kelso
Jedburgh
Selkirk
Hawick
Moffat
Langholm
Lockerbie
Dumfries
Annan
Carlisle
Eden R.
Solway Firth
Kirkcudbright
Whithorn
Luce Bay
Wigtown
Stranraer
Port Patrick
Newton Stewart
Loch Ryan
Castle Douglas
Loch Ken
Barrhill
Girvan
Maybole
Pinmore
Ayr
Troon
Irvine
Kilmarnock
Galston
Muirkirk
Sanquhar
Beattock
Lanark
Galashiels
Melrose
Peebles
Penicuik
Dalkeith
Greenlaw
Edinburgh
Musselburgh
Leith
Linlithgow
Falkirk
Dunfermline
Kinross
Perth
Cupar
Alva
Alloa
Stirling
Callander
Loch Lomond
Alexandria
Dumbarton
Greenock
Paisley
Rothesay
Ardrossan
Saltcoats
Glasgow
Ardrie
Airdrie
Coatbridge
Hamilton
Wishaw
Pollok
Kilbirnie
Dairy
Kilmarnock
Ormsary
Kilmory
Campbeltown
Deas Pt.
Arran
Gigha Island
Islay
Jura
Port Ellen
Port Askaig
Colonsay I.
Coll I.
Tiree I.
Iona I.
Oban
Mull
Lismore I.
Taynuilt
Killin
Loch Tay
Crieff
Loch Awe
Inverary
Loch Leven
Kinross
Kirkaldy
Dysart
Cupar
Loch Rannoch
Loch Lochy
Loch Ness
Loch Linnhe
Loch Luydon
Fort William
Strontian
Arasaig
Inverie
Kingussie
Ballater
Banchory
Aberdeen
Dee R.
Don R.
Ythan R.
Deveron R.
Spey R.
Nairn
Forres
Inverness
Dingwell
Cromarty
Tornagrain
Gairloch
Sleuach
Torridon
Ullapool
Lochbroom
Dornoch
Bonar Bridge
Tain
Dornoch Firth
Kyle of Sutherland
Ben Clachan
Applecross
Stromeferry
Kyle of Lochalsh
Portree
Skye
Kilmuir
Portnaguran
Stornoway
Loch Roag
Loch Bernera
Butt of Lewis
Monach Is.
Barra Is.
Scarpa I.
Harris
Tarransay I.
Sound of Harris
Priest I.
Sound of Raasay
Sound of Rona
Sound of Skye
Sound of Mull
Sound of Islay
Sound of Jura
Sound of Gigha
Sound of Kerrera
Sound of Arran
Sound of Luing
Sound of Shuna
Sound of Seil
Sound of Iona
Passage of Barra
Passage of Coll
Passage of Gigha
Passage of Jura
Passage of Islay
Passage of Orsay
Passage of Colonsay
Firth of Lorn
Firth of Clyde
Firth of Forth
Firth of Tay
Firth of Solway
Loch Ryan
Loch Ken
Loch Lomond
Loch Tay
Loch Awe
Loch Leven
Loch Rannoch
Loch Lochy
Loch Ness
Loch Shin
Loch Eriball
Loch Broom
Loch Luydon
Loch Linnhe
Loch Ness
Loch Lomond
Loch Ken
Loch Ryan
Loch Leven
Loch Awe
Loch Tay
Loch Rannoch
Loch Lochy

become absolutely barbarous if the invasion of the Lord of the Isles had not been repulsed at Harlaw (q.v.) by the skill of the Earl of Mar, and the bravery of the lowland knights and burgesses.

A happier time dawned on the release of James I., 1424, from his English captivity. The events of the following period are better known, and a brief notice of the most important will suffice: for details, see names of the particular kings. The vigorous rule of James I. had restored tranquillity; but strife and discord were brought back on his assassination. One of the most calamitous features of the time was a succession of minors in the sovereignty. James himself had succeeded when a child and a captive; James II., James III., James IV., James V., Mary, and James VI., all succeeded while under age, and all, except James IV., when little more than infants. The courage and ability shown by almost all the Stewart princes were insufficient to repair the mischiefs done by others in the beginning of their reigns, and to abate the great curse of the country—the unlimited power and constant feuds of the nobles. The last addition to the Scottish kingdom was made in the reign of James III., when the islands of Orkney and Zetland were made over to him as the dowry of his queen, Margaret of Denmark. The marriage of James IV. with Margaret of England was far more important in its ultimate results, and brought about in the reign of his great-grandson that peaceful union with England which the death of the Maiden of Norway had prevented in the 13th c. Many good laws were enacted during the reigns of the Jameses; but the wisdom of the Scottish legislature was more shown in framing them than the vigor of the government in enforcing them. Among the most important improvements of the period was the establishment of universities—the first of which, that of St. Andrews, was founded during the minority of James I.—and the institution of the College of Justice in the reign of James V.

During the reign of James V., religious discord added another element to the evils with which Scotland was afflicted. The practical corruptions of the church were greater than almost in any other country in Europe, and one of the consequences was, that the principles of the Reformation were pushed further than elsewhere. The first great ecclesiastical struggle had hardly ceased, by the overthrow of the Rom. Cath. system, when the strife began anew in the Reformed Communion in a contest between Episcopacy and Presbyterianism, the former being supported by the sovereign, the latter by the common people, the nobles throwing their weight into either scale as it suited their policy at the time. James VI. struggled hard to establish an absolute supremacy in both church and state, in opposition to a powerful party which admitted no royal authority whatever in the former, and very little in the latter. After his accession to the English crown, he was apparently successful in carrying out his designs: but during the reign of his son, Charles I., the contest

again broke out, with increased bitterness. The nobility whose rapacity had been checked by the sovereign, joined the popular party. The opponents of the crown bound themselves together, first by the National Covenant, afterward, in alliance with the English Puritans, by the Solemn League and Covenant. Their efforts were completely successful, but their success led to the utter overthrow of the British monarchy by Cromwell.

The restoration of Charles II. was welcomed by all classes, wearied as they were of a foreign and military rule, but especially by the nobles and gentry, who had learned by bitter experience that the humiliation of the sovereign was necessarily followed by the degradation of their order. Had the government of Charles II. and James VII. been reasonably just and moderate, it could hardly have failed in securing general support; but unfortunately it was more oppressive and more corrupt than any which Scotland had experienced since the regencies in the minority of James VI. The natural result was the revolution, which seated William and Mary on the throne.

No sooner had the majority of the nation been successful in this, than many of them began to repent of what they had done, and Jacobitism became more popular than royalist principles had ever been when the House of Stewart was on the throne. The discontent was greatly increased by the fears of English influence. The state of matters grew so threatening after the accession of Queen Anne, that the ruling English statesmen became satisfied that nothing short of an incorporating union between the two kingdoms could avert the danger of a disputed succession to the throne and of a civil war. Supported by some of the ablest and most influential persons in Scotland, they were successful in their design, though it was opposed by a majority of the Scottish people. The Act of Union was formally ratified by the parliament of Scotland 1707, Jan. 16. It received the royal assent, and came into operation May 1 of the same year. The union continued to be unpopular in Scotland for many years, an unpopularity increased by the corrupt means freely used to carry it through. But the discontent gradually ceased, and the ultimate consequences of the measure have been most beneficial to both kingdoms.

The parliament of Scotland was originally composed, like the English parliament, of three classes—the ecclesiastics (bishops, abbots, and priors), the barons, and the burgesses. The spiritual lords, during the establishment of Episcopacy after the Reformation, were composed of bishops only. When Presbyterianism was established at the time of the Covenant, and when it was formally ratified by law at the revolution, the ecclesiastical estate ceased to have any place in parliament. The barons, or immediate vassals of the crown, at first sat in their own right, whether holding peerages or not; but afterward the peers alone sat, the others sending their representatives. The burgesses were the representatives of the burgh. All the three estates sat to the very last in one

house, the sovereign presiding in person, or through a commissioner named by him. When Presbyterianism was formally ratified by law after the revolution of 1688, the ecclesiastical estate ceased to have a place in parliament. Every measure brought before parliament was previously prepared by a committee, styled the lords of the articles, chosen from each of the three orders, but in effect little better than royal nominees. Before the Union there were four great officers of state—the lord high-chancellor, the high-treasurer, the lord privy-seal, and the secretary; and there were also four lesser officers—the lord clerk-register, the lord-advocate, the treasurer-depute, and the justice-clerk. Previously to the era of the revolution the privy-council of Scotland assumed inquisitorial powers, and even torture was administered under the sanction of its authority; but it is now entirely merged in the privy-council of Great Britain. The number of peers in the Scottish parliament was latterly 160, and of commons 155, and all sat in one house, and voted promiscuously. At the union of the kingdoms the political system of Scotland was almost entirely incorporated with that of England. See GREAT BRITAIN.

The Court of Session is the supreme civil court of Scotland. The Court of Judiciary, or criminal court, composed only of judges of the Court of Session, is supreme in criminal cases. The principal subordinate judicatories are sheriff-courts, established in each county or stewartry. Besides the sheriff-court, each county or district of a county has its justice of peace courts; and in every town of any importance are bailie, dean of guild, and police courts, with limited jurisdictions.

It would be impossible within reasonable limits to give a complete account of the original authorities for the history of Scotland. The principal are the following: For the period before the accession of David I.—Venerable Bede, the Early Lives of the Saints, the Irish Annals, the brief Scottish Chronicles published by Innes and Pinkerton, and the ancient English Chroniclers. For the subsequent period till the Reformation—the Chronicles of Melrose and Lanercost, the Scoti Chronicon of Fordun and Bower, Winton's Chronicle, Leslie's and Buchanan's Histories, the English Chroniclers, the Ecclesiastical Cartularies, and the Acts of the Scottish Parliament. For the period from the Reformation to the Union—Knox's, Calderwood's, and Spottiswood's Histories, Baillie's Letters, Woodrow's and Burnet's Histories, the Acts of Parliament, and the State Papers. The Scotch Record publications include *The Exchequer Rolls of Scotland; Accounts of Lord High Treasurer; Register of Privy Council; Documents illustrating Scotch History;* see also *Calendar of State Papers—Scotland,* 1509-1603. Other works are Innes's *Critical Essay,* Pinkerton's *Inquiry,* Chalmers's *Caledonia,* Hailes's *Annals,* the histories of Robertson, Tytler, Laing, and Burton, Chambers's *Domestic Annals,* and Skene's *Celtic Scotland.*

SCOTLAND, CHURCH OF: the Presbyterian Church as established and maintained in Scotland by the govt.—For the Christianization of Scotland, see COLUMBA: CULDEES: NINIAN: PICTS: SCOTLAND. The doctrines of the ancient Scottish Church were the same as those of the rest of western Christendom. In ritual, there were some points of difference, but so slight that the most important related to the time of the Easter festival. In these, also, the Scots gradually conformed to the usage of the Roman and English Churches. In one point, however, there continued for several centuries a marked distinction in ecclesiastical government between the Scots and Irish on the one hand, and the churches of England and the continent on the other. The Scots recognized the same orders of the ministry—bishops, priests, and deacons—as other Christians did; and, like them, they held that ordination could be given only by bishops. But they acknowledged no such supremacy of jurisdiction in the Episcopal order as was held by other churches. In Scotland, there were neither dioceses nor parishes; but there were numerous monasteries, in which the abbots, whether bishops or priests, bore chief rule, all being in subordination to the successor of St. Columba, the presbyter-abbot of Iona, who, in virtue of that office, was primate of the Picts and Scots.

When Iona was desolated by the Northmen, the primacy seems to have been transferred in the middle of the 9th c. to the abbots of Dunkeld, and about 50 years afterward to the Bishops of St. Andrews, who became known as *Episcopi Scotorum*, the bishops of the Scots. Slowly at first, but gradually, an assimilation to the English and continental practices began, a change rendered more easy by the Scottish dominion being extended over Lothian, where the ecclesiastical system was the same as that of England. A great impulse was given in the same direction by the marriage of Malcolm III., King of the Scots, with Margaret, sister of Edgar Atheling. The king and queen used their utmost efforts to introduce English usages in ecclesiastical as in other matters; and Margaret herself held repeated conferences for that purpose with the chief Scottish ecclesiastics, at which her husband acted as interpreter. The principal points in which she attempted to bring about a reform were the commencement of the Lent fast, the superstitious infrequency of receiving the communion, and the lax observance of Sunday and of the scriptural and canonical restrictions on marriage between relations.

The reform begun by Malcolm and Margaret was fully carried out by their youngest son David I. These improvements were completed by his successors, and before the end of the 12th c. the ecclesiastical system of S. differed in no important point from the rest of Europe. Some Scottish writers have lamented the change, as being one from purity of belief and practice to superstition and immorality. This is undoubtedly a mistake. The Celtic Church had become very corrupt, and the clergy were inferior both in learning and in morals to their brethren in the south. King David was a reformer in the best sense of

the word, and it does not detract from the character of his reformation that as time went on the Scottish Church became involved in those superstitions with which the rest of Christendom was overspread.

The ritual of the Scottish mediæval church was almost the same as that of England, the Salisbury Missal and Breviary being the models of the Liturgies and Office Books used in Scotland. The external system of the church—cathedral, parochial, and monastic—was also in almost every point identical. The chief monastic orders were the Benedictine, and its most important branches the Cluniac and the Cistercian, the canons regular of St. Augustine, and the Reformed Premonstratensian canons. The Cluniacs and Cistercians were in strict subordination to the mother-houses of their orders at Cluny and Citeaux. In the 13th c. the Dominican, Franciscan, and Carmelite friars were introduced into Scotland. There were 12 dioceses in the Scottish Church, to which Orkney was added on the transference of those islands to the Scottish sovereign in the 15th c. The 12 dioceses were Caithness, Ross, Moray, Aberdeen, Brechin, Dunkeld, Dunblane, St. Andrews, Argyle, the Isles, Glasgow, and Galloway. The single point in which the mediæval church till the 15th c. differed from that of England and other churches of the west, was in its having no metropolitan. St. Andrews, and next to it Glasgow, had a certain precedence; the bishops of the former see, and failing them the bishops of the latter, having the privilege of crowning and anointing the sovereign. But they had no jurisdiction over the other sees, nor did their bishops bear the style of archbishop. In virtue of a bull of Pope Honorius III. 1225, the bishops, abbots, priors, and other chief ecclesiastics, with representatives of the capitular, collegiate, and conventual bodies, assembled annually in provincial synod, sitting in one house, under the presidency of a conservator chosen by and from the bishops. The chief govt. of the church under the pope thus devolved on these synods and their elective presidents. This continued until the erection of St. Andrews into an archiepiscopal and metropolitan see, in virtue of a bull of Pope Sixtus IV. 1472. By this bull all the Scottish sees were made suffragans to that of St. Andrews, whose bishops were now to be styled archbishops. In 1492 Glasgow was raised to the dignity of a metropolitan see by a bull of Pope Innocent VIII.; and the two Scottish abps. held toward each other the same position as the archbishops of Canterbury and York, being sometimes involved in the similar unseemly broils in regard to jurisdiction and precedence.

S. shared in all the errors of belief and superstitious practices in worship to which the rest of Christendom was subjected, and the ignorance and immorality of the clergy were far worse than in England, or perhaps anywhere else in Europe, except in the Scandinavian churches. The desire for reformation which led to the proceedings of Huss and Wickliffe, produced similar effects in the Scottish kingdom. As early as 1406 or 7, James Resby, English priest, disciple of Wickliffe, was burned at Perth,

and 1433 Paul Crawar, German Hussite, was burned at St. Andrews. The opinions of Wickliffe continued to be privately taught, particularly in the s.w. counties, where his followers were known by the name of the Lollards of Kyle. In the following century, the intercourse with the continent was frequent and close, and the effects of Luther's preaching and writings were soon felt in Scotland. In 1525 the importation of Lutheran books, and the propagation of the Reformer's tenets, were forbidden by act of the Scottish parliament; and 1528, Feb., Patrick Hamilton (q.v.), Abbot of Ferne, was burned at St. Andrews for teaching and publishing Lutheran doctrines. The piety of Hamilton, and the patience with which he bore his sufferings, induced others to follow his teaching and example. Several persons, both ecclesiastics and laymen, were subsequently burned, and many more fled to England or the continent.

The persecution, though encouraged or permitted by the bishops, was disapproved by some ecclesiastics of learning and influence, who were desirous of effecting a reform in the church without breaking off from communion with the hierarchy. The efforts of this school were unsuccessful, and the Scottish nation was gradually divided into two parties—one of which, headed by the bishops and supported by the state, was determined to resist all change; and the other, composed of a considerable number of the clergy both regular and secular, of the gentry, and of the burgesses of the large towns, was disposed to carry its Reforming principles far beyond what had been done by Luther and Melanchthon. These two parties came into deadly conflict 1546. Feb. 28 in that year, George Wishart, most eloquent of the Reforming preachers, was condemned to death by an ecclesiastical court, at which Cardinal Beaton, Abp. of St. Andrews, presided; and was burned. May 28 the cardinal was murdered by Norman Leslie and other adherents of the Reforming party. The struggle continued during the regency of the Earl of Arran and that of Mary of Lorraine, mother of Mary the young Queen of Scots.

In 1559 the Reformers became strong enough to set the regent at defiance. Various circumstances encouraged them to demand freedom for their opinions, particularly the death of Mary of England and the accession of Elizabeth. They were further animated by the return from Geneva of their chief preacher, John Knox. The conflict was to be decided by other than spiritual weapons. The regent, and the Reformed now known by the name Congregation, met in open warfare. The contest ended after a twelvemonth in the triumph of the Congregation. A parliament met at Edinburgh 1560, Aug. 1: the Reforming party had complete ascendency; and the jurisdiction of the pope was abolished, the mass was proscribed, and a Confession of Faith, drawn up by Knox and his associates, was ratified—the spiritual lords making a faint resistance.

The new Confession of Faith adhered, in all essential articles of belief, to the ancient creeds of the church. In

regard to the sacraments, it differed entirely from the recent corrupt teaching of the Western Church; but its language, on the whole, was moderate and conciliatory. In reference to ceremonies, and details of church polity, it declared such things temporary in their nature, and not appointed for all times and places, and that they ought to be altered when they fostered superstition and ceased to be edifying.

A Book of Discipline was soon afterward drawn up by the compilers of the Confession, which was generally approved of, but did not receive the sanction of parliament. It followed out in detail the principles laid down in the Confession. In regard to the office-bearers of the church, various orders were mentioned, but three were specially of importance—ministers, elders, and deacons. Ministers were to be chosen by each several congregation, but were to be examined and admitted in public by the ministers and elders of the church. No other ceremony, such as imposition of hands, was to be used. The elders and deacons were to be chosen yearly in each congregation, and were not to receive any stipend, because their office was to be only from year to year, and because they were not to be debarred from their own private occupations. For better provision for the wants of the time, persons, called superintendents, were appointed in particular districts, with power to plant and erect churches, and to appoint ministers within the bounds of their jurisdiction.

The chief governing as well as legislative and judicial power in the Reformed Church was intrusted to a General Assembly, which met half-yearly or yearly, and was composed of the superintendents, ministers, and lay commissioners; and which gradually, by the introduction of the system of representation, assumed the form and more than the power of a parliament.

The worship of the Reformed Church was modelled on that established by Calvin at Geneva. It was embodied in a formulary called the Book of Common Order, which for nearly a century continued to be generally used. It contained forms for ordinary worship on Sundays and weekdays, and for administration of the sacraments, and for some other occasions. The minister was not absolutely restricted to these forms. Except in the singing of Psalms, the people took no direct part in ordinary worship, and there was no distinction of ecclesiastical seasons, all holydays whatever except Sunday being abolished.

The form of church government established at the Reformation did not remain long undisturbed. Some of the most zealous Protestants thought the danger to which the church was exposed from state tyranny and aristocratical oppression could best be met by restoring the bishops to their ancient position both in the church and in the parliament; while others, of equal zeal and sincerity, saw in this only the commencement of a plan for bringing back all the errors of popery. A scheme of this kind was actually established for some time, and the sees were filled with Prot. bishops set apart for the office by their brethren of

the ministry. It was almost immediately attacked by some of the ministers, who soon found a leader in Andrew Melville, a scholar of considerable eminence, who returned to Scotland 1574, after a residence in Geneva, during which he had ardently embraced the new opinions as to ecclesiastical government maintained by Beza.

The struggle continued for some years, the bishops being encouraged by the sovereign and his advisers, whose support was frequently of little real advantage to them, and Melville, receiving the zealous assistance of many of the ministers, and of the great body of the common people, who sympathized with him in his theories of representative civil and ecclesiastical government. Melville was at last entirely successful. His opinions were embodied in what was called the Second Book of Discipline, which received the formal sanction of the general assembly 1581. This formulary differed much from the First Book. It laid down authoritatively those principles in regard to ecclesiastical authority which the Presb. party among the English Puritans was vainly striving to establish in the southern kingdom, and was in reality an attempt to make the civil power subordinate to the ecclesiastical, even in matters secular. It recognized four orders of office-bearers in the church: the Pastor, Minister, or Bishop; the Doctor; the Presbyter or Elder; and the Deacon. These were to be set apart by ordination, and the imposition of the hands of the eldership; but no one was to be intruded into any office contrary to the will of the congregation, or without the voice of the eldership. Four sorts of church courts, one above another, were sanctioned; first, of particular congregations one or more; second, of a province, or what was afterward called the Provincial Synod; third, of a whole nation; and fourth, of the universal church. What is generally regarded as the most essential feature of the Presb. system—the Presbytery—was not yet introduced in its proper form, the lowest court being a combination of what were afterward known as the Presbytery and the Kirk-Session. It was, however, introduced before 1592, when the privileges of general and provincial assemblies, presbyteries, and parochial sessions were ratified by parliament, though the Book of Discipline itself did not receive formal sanction.

King James had agreed to the establishment of Presbyterianism; but personally, and as a sovereign, he disliked its discipline, and he soon endeavored to overthrow it. His accession to the crown of England enabled him to do this with more authority. He gradually obtained from the general assembly a recognition of the civil rights of the bishops, and this led to restoration of their ecclesiastical privileges. His changes were sanctioned by a general assembly which met at Glasgow 1610, and in the course of the same year Episcopacy was restored in reality, as well as in name, by the consecration of three Scottish prelates, by four of the English bishops, at London. The king wished to assimilate the Scottish Church, as far as possible, to that of England; and his next important

movement was the establishment of what are called the Five Articles of Perth: see PERTH, FIVE ARTICLES OF. These changes excited great dissatisfaction in Scotland, particularly in the s. counties, but it gradually abated to a large extent, and might have ceased, had not further innovations been attempted. It was the wish of James to introduce a prayer-book like that of the English Church, in place of the Book of Common Order, but he saw the danger with which the proposal was attended, and gave it up or postponed it. His son Charles was as inferior to his father in prudence as he excelled him in an ecclesiastical conscientiousness and zeal. During his first visit to Scotland he added another bishopric—Edinburgh—to the dioceses of the Scottish Church. Most unwisely and most improperly he endeavored by his royal authority to introduce into that church a Book of Canons and a Liturgy framed on the model of those of England. The king had many loyal supporters in all parts of Scotland, and in the n. Episcopacy was preferred by the people to Presbyterianism. But the storm of popular indignation which was now roused swept everything before it. The king's opponents banded themselves together by the National Covenant, and in a general assembly at Glasgow abolished the Perth Articles and Episcopacy, and re-established Presbyterianism. Charles attempted to maintain his claim by the sword, but was unsuccessful, and obliged to ratify in parliament all that had been done by his opponents.

Had the Covenanters been satisfied with the victory which they had won, Presbyterianism might have remained the established religion of the Scottish kingdom. But they could not resist the calls from those in England who agreed with their views; rather they yielded to the delusion of extending their own strict discipline over the churches of England and Ireland. They attempted, in the opposite direction, what James and Charles had failed to accomplish. For a time their policy seemed to triumph. The Solemn League and Covenant of the three kingdoms, after having been approved by the general assembly in Scotland, was signed by the Assembly of Divines which the parliament had summoned to meet at Westminster, and by the parliament itself. The ecclesiastical documents afterward drawn up originated with the Westminster Assembly of Divines, but were sanctioned by the assembly in Scotland: the principal were a Directory for Public Worship, a Confession of Faith, and a Larger and Shorter Catechism (see ASSEMBLY OF DIVINES: CREEDS AND CONFESSIONS). The first of these documents was intended to supersede the Book of Common Prayer in England, and, indirectly, the Book of Common Order in Scotland. It laid down certain general rules in regard to public worship and the administration of the sacraments, but left very much to the discretion of the particular ministers and congregations.

The union between the Scottish Presbyterians and that part of the English Puritans who favored a strict ecclesi-

astical government, which should practically control also the civil state, aroused in England a growing protest in behalf of liberty from the domination of ecclesiastics, whether Presb., Episc., or Rom. Catholic. The control of English Puritanism by Scotch Presbyterianism was dissolved by the ascendency of the Independents in England. Scotland, distracted by civil and ecclesiastical dissension, was unable to defend itself against Cromwell, who was opposed to any system of church govt. which claimed control over the civil power or which refused universal toleration of all forms of Protestantism. Scotland was conquered and kept thoroughly under subjection by the English army, which forbade the meetings of the general assembly, but left the other courts and the rest of the church system as they were before. At the Restoration, the higher classes generally, who had suffered under the ecclesiastical tyranny of the Presb. ministers, were zealous for the re-establishment of Episcopacy. The greater part of the nation, except in the s.w. provinces, was indifferent, and the king experienced no difficulty in restoring the bishops to their former rights in both church and state. But Episcopacy alone was restored; there was no attempt to introduce a liturgy, or even to enforce the observance of the Perth Articles. The new primate, Abp. Sharp, was an able man, of good moral character, but ambitious and overbearing, and the Covenanters never forgave his change from Presbyterianism, though he had always belonged to the more moderate of the two parties into which the church was divided. He was almost the only one of the bishops who had political influence; and unfortunately for himself and the hierarchy, that influence was generally used to encourage, not to restrain, the severe measures of the government. When the primate was assassinated, that severity became a cruel tyranny, and many who had no predilection for any particular ecclesiastical opinions were ready to welcome the change which took place at the revolution.

When the Scottish Estates met 1689, to consider what course was to be adopted in the northern kingdom, the bishops declined to abandon King James. Whatever might have been the consequences had they taken the opposite course, this resolution was fatal to the Episc. establishment. William and Mary were called to the throne, and Prelacy was declared an insupportable grievance, and was abolished. In the following year Presbyterianism was re-established, and the Westminster Confession of Faith was ratified as the national standard of belief, and the right of patrons to nominate to ecclesiastical benefices was taken away. In the end of the same year a general assembly was held, the first which had been allowed to meet since its dissolution by order of Cromwell. It was composed, as before, of ministers and elders from the various presbyteries, and of elders from the burghs and universities, and was presided over by a lay commissioner, named by the crown, and a minister elected by the members as moderator. With the exception of some years in

the reign of William, the assembly has continued to meet annually since the revolution, and to transact business during the periods when it was not in session by a commission named by itself for the purpose: see ASSEMBLY, GENERAL. The other chief ecclesiastical events of William's reign were a series of vain attempts on the part of the sovereign to bring about a comprehension of the Episcopal clergy with those of the Establishment, and the passing by the assembly 1697 of what was called the 'Barrier Act' (q.v.), which guarded against sudden legislation, by providing that no permanent act should be passed until it had received the approbation of the majority of the presbyteries.

During the reign of Queen Anne, and in 1707, England and Scotland were united into one kingdom. A special statute was passed for the security of the Prot. religion and Presb. church govt. in the latter country; providing that these should continue without any alteration in time to come, and confirming the act of William and Mary, which ratified the Confession of Faith and settled the Presb. form of church government.

In 1712 an act was passed by the Brit. parliament which restored to patrons in Scotland their right of presentation to benefices. This statute excited great discontent among the members of the Established Church and for many years attempts were made to obtain a repeal of it. Though these attempts were unsuccessful, the provisions of the statute were long practically disregarded. When at length the general assembly began to act upon it, the dissatisfaction increased among those who held the divine right of the people to choose their own ministers. The leader of the discontented party was a minister named Ebenezer Erskine; who with his adherents, 1733, finally separated from the Establishment, and formed a communion which took the title Associate Presbytery, though its members were popularly known as Seceders. The Seceders themselves were soon divided by a very absurd dispute into two bodies, called the Burgher and Antiburgher Synods. In 1761 another secession from the Establishment took place in connection with the law of patronage; and the separated body assumed the name of the Presbytery of Relief.

There were no further secessions from the church; but its members were divided into two parties, known as the Moderates and the Evangelicals (q.v.), the former favorable, the latter hostile to the law of patronage. For many years the Moderates, headed by Dr. Robertson the historian and others of his school, and supported by the influence of the government, maintained ascendency in the general assembly and throughout the country. In the latter years of George III., and during the reign of George IV., this ascendency began to decrease. The political excitement which prevailed in the beginning of the reign of William IV. strongly affected the Scottish Establishment, which from its very constitution is peculiarly liable to be moved by the impulses of popular feeling. The two parties in the general assembly engaged in a struggle more fierce than

any in which they had yet met; and the subject of dispute as before, was immediately connected with the law of patronage. Dr. Chalmers, the most distinguished minister in Scotland, added the whole weight of his influence to the popular party, and 1834 an interim act of assembly was passed, known as the Veto Act, which declared it a fundamental law of the church that no pastor should be intruded on any congregation contrary to the will of the people; and laid down certain rules for carrying out this principle. The legality of this act was doubted; and in connection with a presentation to the parish of Auchterarder, the presentee, on being rejected by the presbytery in terms of the Veto Act, appealed, with concurrence of the patron, to the court of session—the supreme civil court in Scotland. That court decided that the conduct of the presbytery in rejecting the presentee was illegal, and their judgment was affirmed by the house of lords. Other cases of similar nature followed, and something like a conflict took place between the civil and ecclesiastical courts, the former enforcing their sentences by civil penalties, the latter suspending and deposing the ministers who obeyed the injunctions of the court of session. In the general assembly 1843 the dispute came to a crisis. A large number of ministers and elders of the popular party left the assembly, and met apart in a similar body, of which Dr. Chalmers was chosen moderator. They formed themselves into a separate communion under the title 'The Free Church of Scotland,' and gave up their benefices in the Established Church, and all connection whatever with that body. The Free Church carried off about one-half of the members of the Establishment, and became a rival communion in most of the parishes: see FREE CHURCH. The act of Queen Anne was repealed by Lord Beaconsfield 1872, and by an act of parliament 1874, patronage was abolished in the Established Church, and the right of choosing the minister transferred to the congregation: see PATRONAGE.

In 1820 the Burgher and Antiburgher Seceders were united under the name Associate Synod of the Secession Church; and 1847 this Associate Synod and the Relief Synod were united under the name 'The United Presbyterian Church' (q.v.). The recent negotiations for a union of the United Presbyterian Church and the Free Church have led to no practical result —See PRESBYTERIANISM, ETC.

As to the history of *Scottish Episcopacy* subsequent to the revolution, it is a common but erroneous opinion that almost all the Episcopal clergy were Jacobites from the time of the accession of William and Mary. The bishops were so; but a large number, probably a majority of the clergy, had at first no objection to take the oath of allegiance to the new govt. During the reign of Queen Anne the Episcopal clergy were well disposed to the govt., knowing the queen's good wishes to their communion. They were frequently harassed by the courts of the Establishment; but all who were willing to take the oaths obtained an ample protection for their worship on the passing of the

Toleration Act of 1712. On the death of the queen, almost all the clergy, and most of the laity, were involved directly or indirectly in the attempts to overthrow the Hanoverian dynasty, and it was this which finally made the names Episcopalian and Jacobite for many years convertible terms.—In the mean time, the succession of bishops had been kept up by new consecrations, and after some years the dioceses, though diminished in number, were regularly filled. An important change took place in the forms of worship. No longer trammelled by their connection with the state, they adopted liturgical forms similar to those in the English Prayer-book, and in almost all cases identical, except that many of the congregations used an office for the communion modelled on that of the Scottish Liturgy of King Charles I. The Episcopalians took no such open part in the insurrection of 1745 as in that of 1715, but their sympathies were known to be with the House of Stewart; and the govt. carried through parliament some intolerant acts, which were put in execution with great harshness, and which for many years suppressed all public worship in the Episc. communion. It was only after the accession of George III. that these statutes ceased to be actively enforced; and it was not till 1792 that the Episcopalians, who from the death of Prince Charles had acknowledged the reigning dynasty, were relieved from the penal laws. The act which gave this relief imposed restrictions on their clergy officiating in England, and prohibited their holding benefices in the English Church. In 1804 the bishops and clergy agreed to adopt the Thirty-nine Articles of the Church of England, and 1863 the Prayer-book was adopted as the authorized service-book of the Episc. Church, permission being given in certain cases to use the Scottish Communion Office. The restrictions imposed on the Scottish clergy by the act of 1792 were modified 1840; and 1864 entirely removed, the right being reserved to bishops in England and Ireland to refuse institution to a Scottish clergyman without assigning any reason, on his first presentation to a benefice in England or Ireland, but not after he should have once held such benefice.—The dioceses of the Scottish Episc. Church are seven: Moray, Aberdeen, Brechin, Argyle, St. Andrews, Edinburgh, Glasgow. The bishops are chosen by the clergy of the diocese and by representatives of the lay communicants, a majority of both orders being necessary to a valid election. One of the bishops, under the name Primus, chosen by the other bishops, presides at all meetings of the bishops, and has certain other privileges, but possesses no metropolitan authority. The highest judicial body is the Episc. College, composed of all the bishops. The highest legislative body is a General Synod, of two houses, one of the bishops, the other of the deans and the representatives of the clergy.

For the chief original authorities for the ecclesiastical history of Scotland to the revolution, see those mentioned under SCOTLAND (*History*). The chief modern authorities

are: Cook's *History of the Reformation* and *History of the Church of Scotland;* Cunningham's *Church History of Scotland;* Grub's *Ecclesiastical History of Scotland.*

SCOT'LAND, ROYAL ARMS OF: heraldic device officially pertaining to the sovereigns of Scotland. The arms of Scotland are: Or, a lion rampant gules, armed and langued azure, within a double tressure flory counterflory of fleurs-de-lis of the second. Supporters—Two unicorns argent armed maned and unguled or, gorged with open crowns, with chains affixed thereto, and reflexed over the back of the last. Crest—A lion sejant affronté

Royal Arms of Scotland, previous to the Union.

gules crowned or, holding in the dexter paw a sword, and in the sinister a sceptre, both erect proper.

The lion is first seen on the seal of Alexander II., and the tressure on that of Alexander III. The unicorn supporters do not appear on any of the royal seals of Scotland till the time of Queen Mary, on whose first Great Seal (1550) they are represented as chained and gorged with crowns. They were, however, sculptured on Melrose Abbey as early as 1505.

In 1603, in consequence of the union of the crowns of England and Scotland, the Scottish arms came to be quartered with those of England and Ireland, while one of the English lions was adopted as a supporter. See GREAT BRITAIN, ROYAL ARMS OF.

SCOTLAND YARD: London, England, the former headquarters of the metropolitan police, in Whitehall, the name being derived from a palace there, the London residence of the kings of Scotland and their ambassadors. New Scotland Yard, the police headquarters since 1890, is on the Thames Embankment.

SCOTODINIA, n. *skŏt'ō-dĭn'ĭ-ă* [Gr.—from *skŏtŏs,* darkness, obscurity; *dinos,* giddiness]: in *med.,* a disease symptom characterized by giddiness with imperfect vision.

SCOTOGRAPH, n. *skŏt'ō-grăf* [Gr. *skŏtŏs,* darkness; *graphō,* I write]: an instrument to enable one to write in the dark, or to enable one who is blind to write.

SCOTOMA, n. *skŏ-tō'mă,* SCOTO'MATA, n. plu. *-mă-tă* [Gr. *skotōmă,* giddiness; *skŏtŏs,* darkness]: in *med.,* a fixed dark spot or gap in the field of vision.

SCOTT, *skŏt,* CHARLES: soldier: 1733-1813, Oct. 22; b. Cumberland co., Virginia. He held a minor office in Braddock's army, raised the first company s. of the James river for the revolutionary war, was promoted col. 1776, brig.gen. 1777; served in New Jersey and at Stony Point, was taken prisoner at Charleston 1780, and was held till near the close of the war. He removed to Kentucky 1785, rendered valuable service in conflicts with Indians; a town and a county received his name; and he was governor of the state 1808-12.

SCOTT, CLEMENT: English author and journalist: b. London 1841, Oct. 6; d. 1904, June 25. He was educated at Marlborough College and became widely known as a dramatic critic to the *Daily Telegraph* in 1873. Previous to his editorship of *The Free Lance* he was a well-known writer upon the staff of the *Sunday Times,* the *Weekly Dispatch,* the London *Figaro,* and other publications of note, and in 1880 became the editor of the *Theatre,* a London magazine. He was the author of: *Lays and Lyrics; Thirty Years at the Play; From the Bells to King Arthur; The Wheel of Life; Madonna Mia;* and *The Drama of Yesterday and To-day.*

SCOTT, DAVID: Scottish painter: b. Edinburgh 1806, Oct. 10; d. there 1859, March 5. He early determined to become a painter, and began by drawing vignettes and frontispieces for books. In 1827 he formed an association with some artists, who founded the Life Academy for the study of the living model. The following year he exhibited his first picture, *The Hopes of Early Genius Dispelled by Death. The Combat of Fingal with the Spirit of Lodi, Sarpedon Carried by Sleep and Death, Monograms of Man,* and other works painted between 1828 and 1832 indicated the wild and incoherent character of his genius, and the numerous large canvases which he filled with tireless industry and enthusiasm quite failed in producing the effect he anticipated, his pictures being grandly conceived, but wanting in color and finish. In

1841 he exhibited what has generally been considered his greatest picture, *Vasco de Gama Encountering the Spirit of the Storm at the Cape.*

SCOTT, DRED: American negro slave: b. Missouri about 1810; d. after 1857. His case, decided in 1856, Chief Justice Zaney giving the opinion, was one of the exciting causes in the slavery agitation, just before the civil war. It was declared that the negro had no rights white men were bound to respect.

SCOTT, *skŏt,* Sir GEORGE GILBERT: 1811-78; b. Gawcott, near Buckingham, England: ecclesiastical architect. His father was a rector in the English Church, and his grandfather was Thomas Scott, the commentator. After four years' apprenticeship with the architect Edmeston, he began business with a fellow-pupil, Moffat, and built a number of union work-houses and a church, all in the prevailing inartistic styles. In 1839 he awoke to the merit and spirit of mediæval architecture, on reading some writings of Pugin and publications of the Camden Society. He built soon afterward the Martyrs' Memorial at Oxford (1840), inspired by 13th century crosses in honor of Queen Eleanor. The success of this made him the leading eccles. architect of England; and his incessant activity included the building of many churches, and restoration of many more, including the cathedrals of Ely, Hereford, Lichfield, Salisbury, Chichester, Durham, St. Davids, St. Asaph, Chester, Gloucester, Ripon, Worcester, Exeter, Rochester, besides the abbeys of Westminster, St. Albans, etc. He also built the noble Lutheran church and the town-house in Hamburg. In 1862-3 he designed and constructed the Albert Memorial; and was knighted. Notwithstanding his protest against classical styles, he was architect of the new government offices, the India, foreign, home, and colonial. Other works by him were the Midland railway terminus and hotel, besides many private houses. His genius is regarded as less original than studious and painstaking. Besides many articles and reports, during his life, his many lectures as prof. of arch. in the Royal Academy were published after his death; also *Domestic Architecture,* and *Personal and Professional Recollections* (1879).

SCOTT, GUSTAVUS HALL: naval officer: 1812, June 13 —1882, March 23; b. Fairfax co., Virginia. When 16 years of age he became midshipman in the United States navy; served in the West Indies, and 1839 in the Seminole war; was connected with the Pacific squadron 1852, and was light-house inspector 1858-60. He remained loyal to the Union, and served with credit at the James river, and at various points on the Atlantic coast, during the civil war. He was again light-house inspector 1869-71; and 1873, till his retirement on account of age, 1874, was in command of the n. Atlantic squadron. He was promoted captain 1863, commodore 1869, and rear-admiral 1873. He died at Washington.

SCOTT, JOHN MORIN: 1730–84, Sep. 14; b. New York; descended from a noble family of Ancram, Scotland. He graduated from Yale College 1746, became a lawyer, was prominent in founding the order of the Sons of Liberty, was a defeated candidate for the continental congress 1774, but was a member of the general committee of New York and of the provincial congress 1775. He became brig. gen. 1776, and served at the battle of Long Island, but resigned his commission the following year; was sec. of state for N. Y. 1777–79, and a member of congress 1780–83. He died at New York.

SCOTT, Sir MICHAEL: see SCOT, MICHAEL.

SCOTT, THOMAS, D.D.: 1747, Feb. 16—1821, Apr. 16; b. Braycroft, Lincolnshire, England: biblical commentator. For nine years he was a farm-laborer. After ordination, he was curate of Weston Underwood, and in 1780–85 of Olney, succeeding John Newton, whose writings converted S. to Calvinism, a change narrated in his book *The Force of Truth* (1779), which, in its turn, converted Henry Kirke White. He was chaplain and lecturer of Lock Hospital, London, 1785–1801, after which he was vicar of Aston Sandford till his death. His well-known chief work, *A Family Bible with Notes*, 5 vols. (1788–92)—not critical or learned, but devout and practical—passed through numerous editions, in Britain and this country, numbering 100,000 copies to 1855. Other works were: *Essays on the Most Important Subjects in Religion* (1793); *Scripture Doctrine of Civil Government* (1792); *Warrant and Nature of Faith Considered* (1798); *Signs of the Times* (1799); *Chronological Tables of the Bible* (1811); *Remarks on the Refutation of Calvinism by the Bishop of Lincoln* (1811); *Treatise on Growth in Grace;* and numerous sermons. His son edited his complete works 1823, and published his life 1822.

SCOTT, THOMAS ALEXANDER: railroad manager: 1824, Dec. 28—1881, May 21; b. Loudon, Penn. He was educated at the common schools; was clerk in country stores; and 1841, Aug. 1, became clerk to Maj. Patton, state road toll-collector, Columbia, Penn. Six years later he was appointed chief clerk to the toll-collector of Philadelphia. In 1850 he became connected with the Pennsylvania railroad, then in process of construction; was appointed supt. of the w. division of this road 1852, 1858 became gen. supt., and 1859 was elected vice-pres. His brilliant management of the road attracted general attention. During the civil war he rendered invaluable services to the country in organizing and perfecting a wonderfully efficient system of transportation of govt. troops. He was a staff-officer to Gov. Curtin, of Penn.; was commissioned col.; was for some time in charge of govt. railroads and telegraphs; and 1861 was asst. sec. of war. He developed the Texas Pacific railroad system, and was its pres. for several years; was connected with other prominent roads; and was pres. of the Pennsylvania railroad 1874–80, resigning in the latter year on account of ill health. After travelling extensively in Europe and the East, he returned to Penn., and died at Darby.

SCOTT, Sir WALTER: 1771, Aug. 15—1832, Sep. 21; b. Edinburgh; fourth child of Walter Scott, writer to the signet in Edinburgh; of the old Border family, the Scotts of Harden, offshoot from the house of Buccleuch. Though he matured into a man of robust health, and of strength nearly herculean, as a child he was feeble and sickly, and very early he was smitten with a lameness which remained through life. His childhood was passed mostly at Sandyknowe, the farm of his grandfather, in Roxburghshire. Here the foundations of his mind were laid; and his early and delighted familiarity with the ballads and legends then floating over all that part of the country probably did more than any other influence to determine the sphere and modes of his literary activity. Between 1779 and 83 he attended the High School of Edinburgh, where, with occasional flashes of talent, he shone considerably more on the play-ground as a bold, high-spirited, and indomitable little fellow, with an odd turn for story-telling, than he did within as a student. In 1783 he went to the university, and remained three years—as it seemed, not greatly to his advantage. Afterward, in the height of his fame, he was wont to speak with deep regret of his neglect of his early opportunities. But though leaving college but scantly furnished with the knowledge formally taught there, in a desultory way of his own he had been hiving stores of valuable though unassorted information. From earliest childhood, he was an insatiable reader; and his memory was of extraordinary range and tenacity. Of Latin, he knew little, of Greek less; but a serviceable though somewhat inexact knowledge of French, Italian, Spanish, and German he had acquired, and he retained. On the whole, for his special purposes, his education was perhaps as available as if he had been the pride of all his preceptors. In 1786 he was articled apprentice to his father. On the completion of his apprenticeship, 1790, he studied law, and was called to the bar 1792. In his profession he had fair success, and 1797 he was married to Charlotte Margaret Carpenter, of French birth and parentage. Toward the end of 1799, through the interest of his friends Lord Melville and the Duke of Buccleuch, he was made sheriff-depute of Selkirkshire, an appointment which brought him £300 a year, with not very much to do for it. Meantime, in a tentative and intermittent way, his leisure had been occupied with literature, which more and more announced itself as the main business of his life. His first publication, a translation of Bürger's ballads, *Lenore* and *The Wild Huntsman*, was issued 1796. In 1799 appeared his translation of Goethe's drama of *Goetz von Berlichingen;* and in the year following he wrote the fine ballads, *Glenfinlas*, the *Eve of St. John*, and the *Grey Brother*. The year 1802 gave to the world the first two volumes of his *Border Minstrelsy*, followed 1803 by the final volume. This work, the fruit of those 'raids'—as he called them—over the Border counties, in which he had been wont to spend his vacations, was favorably received, and at once won for him a prominent place among literary men. In 1804 he issued an edition of the old poem *Sir Tristrem*, admirably

SCOTT.

edited and elucidated by valuable dissertations. Meantime *The Lay of the Last Minstrel* had been in progress, and by its publication, 1805, S. became the most popular author of his day. During the next ten years, besides a mass of miscellaneous work, the most important items of which were elaborate editions of Dryden (1808) and of Swift (1814), including in each case a Life, he produced the poems *Marmion* (1808), *The Lady of the Lake* (1810), *The Vision of Don Roderick* (1811), *Rokeby* (1813), *The Bridal of Triermain*, anonymously published (1813), *The Lord of the Isles*, and *The Field of Waterloo*. The enthusiasm with which the earlier of these works were received somewhat began to abate as the series proceeded. The charm of novelty was no longer felt; moreover, a deterioration in quality is not in the later poems to be denied; and in the bold outburst of Byron, with his deeper vein of sentiment and concentrated energy of passion, a formidable rival had appeared. All this S. distinctly noted, and after what he felt to be the comparative failure of *The Lord of the Isles*, in 1815, he published no more poetry except the anonymous *Harold the Dauntless* (1817). But already in *Waverley*, which appeared without his name 1814, he had achieved the first of a new and more splendid series of triumphs. *Guy Mannering*, *The Antiquary*, *The Black Dwarf*, *Old Mortality*, *Rob Roy*, and *The Heart of Midlothian* rapidly followed; and the 'Great Unknown,' as he was called (whom yet every one could very well guess to be no other than Walter S.), became the favorite of the hour. The rest of the famous series, known as the Waverley Novels, need not be mentioned in detail. From this time, for some years, S. stood on such a pinnacle of fame and brilliant social prosperity as no other British man of letters has ever nearly approached. He resided chiefly at Abbotsford, the 'romance in stone' that he had built in the Border country which he loved; and thither, as 'Pilgrims of his Genius,' summer after summer repaired crowds of the noble and the distinguished, to partake the princely hospitalities of a man whom they found as delightful in the easy intercourse of his home as they had found him in his writings. In 1820, to set a seal on all this distinction, a baronetcy was bestowed on him as a special mark of the royal favor. But the stately fabric of his fortunes, secure as it seemed, was in secret built on the shifting sands of commercial speculation, and in the disastrous crisis of 1826 a huge ruin smote it. In 1805 S.'s income, as calculated by his biographer, was nigh £1,000 a year, irrespective of what literature might bring him; a competency shortly, by his appointment to a clerkship of the court of session, to have an increment at first of £800, subsequently of £1,300. After the publication of *Waverley* (1814), his income from authorship was greatly enlarged. But what was ample for all prosaic needs seemed poor to his imagination, with its fond and glittering dreams. Already some such vision as at Abbotsford was afterward realized, flitted before his mind's eye, and it was the darling ambition of his heart to re-create and leave behind him, in the founding of a family, some image of the olden glories

which were the life of his literary inspirations. In 1805, lured by the prospect of profit, and without the knowledge of his friends, he joined James Ballantyne, an old schoolfellow, in the establishment of a large printing business in Edinburgh. To this, about 1810, a publishing business was added, under the nominal conduct of John Ballantyne, brother of James; S., in the new adventure, becoming as before a partner. Gradually the affairs of the two firms became complicated with those of the great house of Constable & Co., who were in further complication with the London house of Hurst & Robinson, in whose sudden collapse 1826 S. found himself one forenoon a bankrupt, with personal liabilities to the extent of something like £150,000.

'In the reproof of chance
Lies the true proof of men'—

and now, in this challenge of adverse fate, S.'s manhood and proud integrity were nobly proved. With his creditors, composition would have been easy; but this usual course he disdained. 'God granting me time and health,' he said, he would owe no man a penny. And somewhat declined as he now was from the first vigor and elasticity of his strength, he set himself by the labor of his pen to liquidate this enormous debt.

Breaking up his establishment at Abbotsford, where the wife whom he loved lay dying, he hired a lodging in Edinburgh, and there for some years, with stern and unfaltering resolution, he toiled at his prodigious task. The stream of novels flowed as formerly; a *History of Napoleon*, in eight volumes, was undertaken and completed, with much other miscellaneous work; and within two years S. had realized for his creditors the amazing sum of nearly £40,000. A new and annotated edition of the novels was issued with immense success, and there seemed every prospect that, within a reasonable period, S. might again front the world, as he had pledged himself to do, not owing any man a penny. In this hope he toiled on; but the limits of endurance had been reached, and the springs of the outworn brain broke in that stress of cruel and long-continued effort. In 1830 he was smitten down with paralysis, from which he never thoroughly rallied. It was hoped that the climate of Italy might benefit him; and the government placed at his disposal a frigate in which to proceed thither. But in Italy he pined for the home to which he returned only to die. At Abbotsford, 1832, Sep. 21, he died with his children round him and the murmur of the Tweed in his ears. On the 26th he was buried beside his wife in the old Abbey of Dryburgh.

In estimate of S. as an author, few words must suffice. As regards his poetry, there is now little difference of opinion. Its merits, though somewhat superficial, are very genuine, and continue to secure for it some portion of the popular favor with which it was at first received. Deficient in certain of the higher and deeper qualities, and in that exquisiteness of finish which we are of late accustomed to exact, it is admirable in its frank *abandon*, in its bold-

WINFIELD SCOTT.

ness and breadth of effect, its succession of clear pictures, its rapid, easy narrative, its unfailing life, spirit, vigorous and fiery movement. As a lyrist, S. specially excelled; and scattered hither and thither in his works are found little snatches of ballad and song scarcely surpassed in the language. The rank of S. as a writer of prose fiction, it is not so easy to fix with precision. So imposing to the mind is his immense *prestige* as a novelist, that even at this date it is difficult to *criticise* him coolly; but it is not without risk of awakening some under-murmur of dissent, that the absolute supremacy can now be assigned him which at one time, almost without question, was conceded as his due. Nor is the dissent without some ground of reason. S., with the artistic instinct granted him in largest measure, had little of the artistic conscience. Writing with the haste of the *improvisatore*, he could exercise over his work, as it proceeded, no jealous rigor of supervision; and on its appearance he was amply pleased with it if the public paid him handsomely. Hence he is an exceedingly irregular writer; many of his works are in structure lax and careless, and some of the very greatest of them are disgraced by occasional infusions of obviously inferior matter. Yet, all reasonable deductions made, it may be doubtful whether in mass and stature he is quite reached by any other novelist who could be mentioned. To class him, or even speak of him, with Shakespeare, is absurd; but it is scarcely absurd perhaps to say that, *since* Shakespeare, to no British man has such wealth in this kind been intrusted. If, as we believe, the final test of greatness in this field be the power to vitalize character, to enrich our experience by imaginative contact with beings ever after more intimately distinct and real for us than the men with whom we daily shake hands, very few writers can be held to surpass Scott. Further, he invented the historical novel, and in doing so created a distinct literature, brought life into our conceptions of the past, and revolutionized our methods of writing history itself by a vivid infusion into them of picturesque and imaginative elements. On his *Scotch* novels his fame most securely rests; the others being in general obviously inferior. S.'s was essentially a great, sagacious, *practical* intelligence; on the speculative side he was defective.—See Lockhart's *Life of Sir Walter S.* (1837); and *Life* by Hutton (1878).

SCOTT, William; see Stowell, Lord.

SCOTT, Winfield: general: 1786, Jan. 13—1866, May 29; b. Petersburg, Va.; of Scottish ancestry. He was educated at William and Mary College, and studied law; but 1808, having a genius for military pursuits, he was appointed capt. of light artillery in Gen Wilkinson's division, stationed at Baton Rouge, La.; but was suspended for having accused his general of complicity with the conspiracy of Aaron Burr. At the commencement of the war of 1812, he was appointed lieut.col., and sent to the Canadian frontier. He crossed with his regt. at Queenston Heights, where the American troops were at first successful; but on the British receiving reinforcements, they

were repulsed with heavy loss, and S. was taken prisoner. The following year, having been exchanged, he was appointed adjt.gen., and was wounded by the explosion which followed the assault on Fort George. In 1814, as brig.gen., he established a camp of instruction, and from April till July drilled his raw levies in the French tactics with such effect that July 3 he took Fort Erie, opposite Buffalo, by assault; and on the 5th fought a sharp drawn battle at Chippewa, and 20 days later the famous frontier battle of Lundy's Lane, in which he had two horses killed under him, and was twice wounded, the last time severely. He was raised to the rank of maj.gen.; and compiled the General Regulations of the Army, and translated and adapted from the French the system of Infantry Tactics, which was afterward the text-book of the U. S. army. In the Indian hostilities of the American frontier, in the excitement attending the threat of nullification in S. C., and in the Seminole war, Gen. S. manifested those qualities of wisdom and moderation which made him rather a pacificator than a warrior. During the Canadian revolt 1837-8, he showed great tact in allaying the excited passions of the frontier. In 1841 he was appointed commander-in-chief of the U. S. army, and 1846 directed the military operations in the war against Mexico. Taking the field in person, he, 1847, Mar. 9, landed 12,000 men at Vera Cruz, and invested and bombarded the city, which capitulated on the 26th. Apr. 18 he carried the heights of Cerro Gordo, on the 19th he took Jalapa, on the 22d Perote, and May 15 Puebla, where, owing to his heavy losses, chiefly by diseases incident to the climate, he was obliged to wait for reinforcements. Aug. 10 he advanced, with 10,780 men, to encounter the larger forces and strong positions of Gen. Santa Anna. He turned El Peñon, and won the brilliant victories of Contreras and Churubusco. Santa Anna entered upon negotiations only to gain time and strengthen his defenses. These were followed by the sharp and sanguinary battles of Molino del Rey and Churubusco, Sep. 8, strong positions skillfully and bravely defended by superior numbers; and on the 14th S. entered the city of Mexico at the head of less than 8,000 soldiers. Peace was negotiated with the cession of New Mexico and California to the United States, and the victorious general was welcomed home with the liveliest demonstrations.—In 1852 Gen. S. was the candidate of the whig party for the presidency, but was defeated by one of his subordinate officers, Gen. Franklin Pierce. In 1855 was created for him the office of lieut.gen. At the beginning of the war of secession 1861, he foresaw more than many others its extent and serious character, and advised the calling out a much larger force than was first brought into the field. He had even suggested the advisability of allowing the 'wayward sisters to part in peace.' Age and growing infirmities compelled him 1861, Nov., to retire from active command. He subsequently visited Europe and published his *Memoirs* (8vo, 2 vols. New York 1864).

SCOTTISH LANGUAGE AND LITERATURE: term appropriated to denote the language and literature of that form of the English tongue in use north of the Tweed. As the Scots were originally Irish Celts who settled in the Western Highlands of Alban, the phrase Scottish language ought to denote, and did originally denote, *Ersch*, or *Gaelic;* but the gradual extension of the authority of the Scottish kings, first over their Celtic neighbors the Picts, then over the Kymry or Cymry (q.v.) of Strathclyde, and the Angles of Lothian and the Merse, led to the name 'Scottish' being given to the language of the last of these; though, in reality, the true old 'Scottish'—i.e., the Gaelic, the speech of Kenneth MacAlpin and Malcolm Canmore—is further removed from the 'Scottish' of Ramsay and Burns (which is essentially northern English) than the latter is from Russian or Sanskrit. On this point Dr. Murray remarks, in a scholarly treatise in *Transactions of the Philological Soc. for* 1873 (now unfortunately out of print), which is a standard authority on the subject: 'Ethnologically speaking, the Lowland Scotch dialects are forms of the Angle, or English, as spoken by those northern members of the Angle, or English, race who became subjects of the king of the Scots . . . . More particularly they are forms of the Northumbrian or northern English—"the language of the Northin lede"—which up to the war of independence was spoken as one language, from the Humber to the Forth, the Grampians, and the Moray Firth; but which, since the final renunciation of attempts upon the independence of the kingdom, has had a history and culture of its own, has been influenced by legal institutions, an ecclesiastical system, a foreign connection, and a national life, altogether distinct from those which have operated upon the same language on the southern side of the Border.'

Using, then, the term 'Scottish' to denote the English used north of the Tweed, and omitting all consideration of anything written in Celtic, we may divide the history of *Scottish literature* into two periods; the first extending from the date of the earliest composition to the union of England and Scotland under one king, the second from that time to the present day.

A well-known brief lament for the death of Alexander III. preserved by Wyntoun, and marked by considerable beauty and pathos, is one of the scanty specimens of Scottish poetry which have come down to us from the early Middle Ages. The first Scottish *poet*—in the proper sense of the word—was John Barbour (q.v.), archdeacon of Aberdeen, born in the first quarter of the 14th c., died 1395. His great work is the poem of *The Brus*, in which he celebrates the struggles and final victory of King Robert Bruce. Barbour is superior to any English writer of the same century, except Chaucer and Langland. His language is purer English, being less influenced by French idioms and vocabulary, than that used by the great author of the *Canterbury Tales*. Later Scottish poets, however,

used a language that had become deeply influenced by French forms.

The 15th c., during which England produced no poetical writer of eminence, was fertile in Scottish poets. First in rank, and scarcely inferior to any in genius, was James I., King of Scotland, author of *The Kingis Quhair*—i.e., The King's Quire or Book, the authenticity of which has been called in question, but is generally upheld. Before James, in point of time, was Andrew Wyntoun, prior of Lochleven, who wrote a metrical chronicle. Another Scottish poet of this century was Henry the Minstrel, or Blind Harry (q.v.), whose poem on the life of Wallace, in a modernized text, was long a popular favorite in Scotland; but the exploits of his hero must have taxed the credibility of the educated.

The closing years of the 15th c., and the first half of the 16th, were distinguished by poets of still higher name. Foremost is William Dunbar (q.v.), author of *The Thrissill and the Rois*, *The Goldyn Targe*, and many smaller poems, both serious and satirical, of high merit. His *The Lament for the Makaris* is a valuable contribution to contemporary library history. Robert Henryson, schoolmaster of Dunfermline (died about 1506), wrote many poems; some classical, as the Testament of *Cresseid*, some wholly popular, as *Robene and Makyne*, the earliest known pastoral in the Scottish tongue. Gawin Douglas (q.v.), son of the Earl of Angus, and bp. of Dunkeld, was contemporary with Dunbar (about 1474–1522). He wrote several original poems, but his principal work is the translation in which the first gave 'rude Scotland Virgil's page.' The last remarkble writer of this age is Sir David Lyndsay of the Mount (died 1555). The 16th c. produced also the first Scottish prose-writers. Among these are the anonymous author of *The Complaint of Scotlande* (edited 1873 by Dr. Murray); and John Bellenden (q.v.), translator of Boece's *Scotorum Historiæ* and of the first five books of Livy. [The Scottish Text Soc., which began to issue to its members 1883, was founded mainly in order to secure good texts of the poets named here, as also of the popular poetry of Scotland, the metrical romances, as *Sir Tristrem* (see THOMAS THE RHYMER), old Scottish prophecies, chronicles, folk-lore. David Laing's editorial labors were most valuable and important in this department.] With Alexander Montgomerie (1540–1610) ceased that succession of poets or 'makaris' writing in the Scottish dialect which had continued without interruption from the time of Barbour. It was more than a century before another made his appearance. A quaint attempt to continue the vernacular songs and ballads by associating the melodies and rhythm with religious themes is found in *The Gude and Godlie Ballatis* (1567) of the three Wedderburn brothers, who 'turned manie bawdie, songs and rymes in Godlie rhymes' (edited for the Scottish Text Society by Prof. A. F. Mitchell, Edinburgh, 1897). Most of the scholars of that time

wrote in Latin; but for one vernacular prose-work of great merit as a composition, *The History of the Reformatioun of Religioun within the Realme of Scotland*, we are indebted to the leader of that movement, John Knox (q.v.).

We close our account of this first period by the statement that till the period of the Reformation every Lowland Scot knew that his language was 'Inglis,' and the only one who did not speak of it as such was Gawin Douglas. The accession of King James to the crown of England was unpropitious to the vernacular literature of Scotland, to which the Reformation had already dealt a deadly blow. The parliament still met at Edinburgh, but the capital had ceased to be the residence of a court, and the language began to be regarded as an uncouth dialect of the English. The best authors composed in the classic English of the south. In that language Drummond (q.v.) of Hawthornden wrote his verses, Abp. Spottiswood (q.v.) and Bp. Burnet their histories, and Abp. Leighton (q.v.) and Henry Scougal (q.v.) their theological works, so far as they were not in Latin.

It might have been expected that the union of the kingdoms, by which Scotland was deprived of a legislature of her own, would have soon ended the cultivation of the native literature; but the fact was otherwise. There was a strong popular prejudice against the Union, and this caused a strong assertion of nationality, apart from the existing religious jealousies.

At this time appeared the first Scottish poet of true genius since the dark age of the country's literature set in—Allan Ramsay (q.v.), author of *The Gentle Shepherd*, pub. 1725. Ramsay had also the merit of preserving many of those songs and ballads which have since become so famous, but whose authors are quite unknown. How far these works are productions of an earlier age, and how far they are the composition of authors in the 18th c., has been keenly discussed.

To the deep attachment to the exiled line of kings cherished by a large party in Scotland, and to the romantic times of 'The Fifteen' and 'The Forty-five' we owe the exquisite Jacobite songs of Carolina Oliphant, Baroness Nairne and other writers.

While these feelings were dying away under the influence of the mild government of George III., the close of the century was made famous by the appearance of the most illustrious of Scottish poets. It is needless here to describe Robert Burns (q.v.). Admired by all ranks in Britain and the United States, he continues to be the chosen classic of the peasantry of the Scottish Lowlands. It is as an English writer that Sir Walter Scott (q.v.) is famous; but many of his lyrical pieces, and the dialogues in his novels, where the speakers use their own northern tongue, entitle him to be ranked as the last and greatest of Scottish writers.

There is, however, no doubt that, notwithstanding the

fine and various manifestations of literary genius in the Scottish dialect during the 18th and 19th c., the dialect has for the last 200 years been going through a process of uninterrupted decay. The introduction of southern English as the standard or classic form of speech after the union of the crowns, and the dominating influence of the Authorized Translation of the Holy Bible, which became a household classic, slowly but surely sapped the foundations of the old Anglian tongue of Scotland, till most of its peculiarities disappeared. The tongue of Ramsay, Ferguson and Burns is a compromise between the old vernacular and standard English.

See Craik's *History of English Literature and the English Language* (1864); David Irving's *History of Scottish Poetry* (Edin. 1861); Cosmo Innes's preface to his ed. of Barbour's *Brus* (1856); and Dr. J. M. Ross's *Early Scottish History and Literature* (1884).

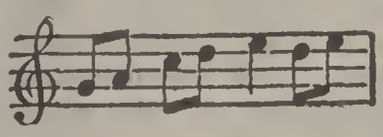
Among writers who have followed Scott in associating Scottish localities with literature are John Galt (1779–1830), author of *The Provost* and *The Ayrshire Legatees*, John Wilson (1785–1854) in *The Trials of Margaret Lindsay*, John Brown (1810–1882) in *Rab and His Friends*, Margaret Oliphant in *Katie Stewart* and *The Minister's Wife*, George Macdonald (1824–1905) in *David Elginbrod* and *Alec Forbes of Howglen*, Robert Louis Stevenson (1850–1897) in *Kidnapped* and *Weir of Hermiston*, John Watson in *The Bonnie Brier Bush*, James M. Barrie in *Auld Licht Idylls* and *A Window in Thrums*, S. R. Crockett in *The Men of the Moss Hags*, and George Douglas Brown (1869–1902) in *The House with the Green Shutters*.

The magnificent ballad poetry of Scotland has received due attention; notably in the five volume edition (1882 to 1898) of F. J. Child's *English and Scottish Popular Ballads*; Scott's *The Ministrelsy of the Scottish Border* (1803, new ed. by T. F. Henderson, 1902); Chambers's *The Popular Rhymes of Scotland* (1870); David Laing's *Select Remains of the Ancient Popular and Romantic Poetry of Scotland* (1885); and Patrick Buchan's *The Ballad Ministrelsy of Scotland* (1901). Another valuable compendium is Andrew Cheviot's *Proverbs, Proverbial Expressions and Popular Rhymes of Scotland* (1902).

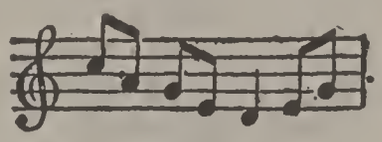
The standard work on the language is Dr. John Jamieson's *Scottish Dictionary*, published in 1808; new and enlarged edition, 1887. See also G. Gregory Smith's *Specimens from Middle Scots* (1902) and W. Hand Browne's *Selections from the Early Scottish Poets* (1896). For the literature, consult John Veitch's *History and Poetry of the Scottish Border* (1893), John Nichol's *A Sketch of Scottish Poetry* (1871), Hugh Walker's *Three Centuries of Scottish Literature* (1895), John Hepburn Millar's *The Literature of Scotland* (1903), T. F. Henderson's *Scottish Vernacular Literature, A History* (1900), and James Main Dixon's *A Survey of Scottish Literature in the Nineteenth Century* (1907).

SCOTTISH MUSIC: famous class of national airs of peculiar style and structure, possessing a wild, dignified, strongly marked, and expressive character. They are generally considered to be of great antiquity; the few notes on which the oldest of them turn, and the character of the modulation, lead to the inference that they originated when the musical scale and musical instruments of the country were in a rude state; but there is a deficiency of evidence regarding their early history. No musical MS. of Scottish airs is now known to exist of older date than 1627; and we have no knowledge when and by whom the early Scottish melodies were composed, or how long they continued to be handed down traditionally from generation to generation. They may probably have been committed to notation in the 15th and 16th c.; and their disappearance is not wonderful, when we take into account, first, the strong measures resorted to, about 1530, by both civil and ecclesiastical authorities, to put down all ballads reflecting on the Rom. Cath. hierarchy, and afterward the ill-will shown by the dominant Presbyterians toward worldly amusements, including not a few entirely innocent. The most valuable of existing early collections of Scotch melodies is the Skene MS., in the Advocates' Library, noted down by Sir John Skene of Hallyards about 1630. It contains a number of native airs, mixed with some foreign dance-tunes—more than a hundred in all. Many of the Scotch melodies differ considerably from the more modern versions, presenting in general a ruder outline; but often exhibiting beauties which the changes that these airs have subsequently undergone have only tended to destroy.

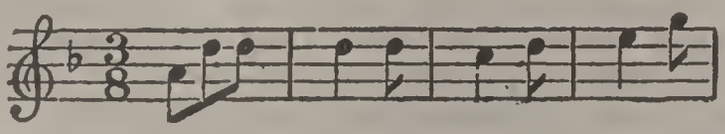
Among the peculiarities which give character to the music of Scotland, most prominent is the prevalent omission of the fourth and seventh of the scale, and consequent absence of semitones, giving rise to such melodic forms as



or



Passages of this kind occur in all the airs of Scotland which have any claim to popularity, and form one of their most recognizable features. Another characteristic is the substitution of the descending for the ascending sixth and seventh in the minor scale, as at the beginning of the air called *Adew, Dundee,* in the Skene MS.—



A very prevalent course of modulation is an alternation between the major key and its relative minor, the melody thus ever keeping true to the diatonic scale of the principal key, without introduction of accidentals. An air will

often begin in the major key and end in the relative minor, or the reverse. The closing note is not necessarily the key-note, a peculiarity remarkable especially in the Highland airs, which, if in a major key, most frequently terminate in the second; if in a minor, on the seventh. Closes are found also on the third, fifth, and sixth. The peculiarities of modulation of the music of Scotland have something in common with the modes of ancient ecclesiastical music, to which it may be more correctly said to belong, than to the modern major and minor keys; and the avoidance of the fourth and seventh may have originated in the imperfection of the ancient wind-instruments; yet these peculiarities are not found in the national airs of other countries where ecclesiastical music may be supposed to have had the same influence, and the early instruments to have been equally imperfect.

Among the more modern printed collections of Scottish melodies with words, most important are George Thomson's collection, with symphonies and accompaniments by Pleyel, Kozeluch, Haydn, Beethoven, Hummel, and Weber (Vols. I.-IV. 1793-1805; V. 1826; VI. 1841), one distinguishing feature of which was the appearance of Burns's words conjoined with the old melodies of the country; and a more recent collection in 3 vols., published by Messrs. Wood & Co., and edited, with historical, biographical, and critical notes, by G. F. Graham (1848-9).

On the subject of Scottish music generally, reference is made to Dauney's *Ancient Scottish Melodies, with Introductory Inquiry* (Edin. 1838).

SCOTTISH PHILOSOPHY, School of: the school of philosophy founded by Thomas Reid, whose aim was to disprove the skeptical conclusions of Hume, which had obtained a wide vogue in Great Britain and on the Continent. Reid, who was born in Kincardineshire, Scotland, 1710, Apr. 26, and died in 1796, insisted upon certain principles as everywhere present in experience, and he appealed to human consciousness and intelligence against what he called 'the ideal theory.' The resemblance of Reid's philosophy to Kant's vindication of the categories as elements necessary to the constitution of the simplest experience is obvious. Reid and his successors cannot be said to have produced a system, but they started many others in a train of thought that led to valuable philosophical observations, and the Scottish School of Philosophy proved no insignificant breakwater to the tide of skepticism which rose so high in the 18th century. Besides Reid, the most noted representatives of the Scottish Philosophy were Dugald Stewart (1753-1828), Sir William Hamilton (1788-1856), W. Whewell, master of Trinity College, Cambridge (1794-1866), Henry Calderwood (1830-98), and J. Campbell Fraser (still living). James McCosh (president of Princeton University from 1868 to 1888) and Noah Porter (president of Yale University from 1871 to 1886) belonged to the same

school, and as teachers of philosophy contributed largely to its influence in this country.

SCOTUS. See DUNS SCOTUS; SCHOLASTICISM.

SCOTUS ERIGENA, JOHANNES: Christian philosopher of the Carlovingian period. Everything concerning the place or date of his birth is conjectural. It has been divined from his name that he was of Scottish race, and Irish birthplace. He was probably born between 810 and 815. He is said by some apocryphal authorities to have traveled in Greece, Asia, Egypt, Italy, and France. But his first actual appearance in history is in the court of Charles the Bald, who was himself devoted to letters. He was induced by this monarch to translate the treatise *On the Heavenly Hierarchy,* the work of the pseudo-Dionysius the Areopagite. The attention of Hinemar, archbishop of Rheims, was attracted by the fame of Erigena, who wrote at that prelate's request his work on *Predestination. The Heavenly Hierarchy* was a work which had a great deal of influence in development of mysticism in France.

Johannes Scotus Erigena translated all the works of the supposed Areopagite, he also composed a treatise on the Eucharist, in which he denied the real presence. His philosophical views were set forth in his *Divisions of Nature,* which caused him to be charged with pantheism; and modern historians of philosophy have looked upon him as the precursor of Spinoza.

SCOUGAL, *skô'gal,* HENRY: theologian: 1650-78; b. Salton, Scotland; son of Bishop Patrick Scougal. He studied at King's College, Aberdeen; was prof. of philosophy in that institution 1669; was pastor of a small congregation at Auchterless 1673; and the following year became professor of divinity at Aberdeen. He published *The Life of God in the Soul of Man* (1671). This work was edited by Bishop Burnet, passed through several English editions, and was translated into French. His collected works have been printed.

SCOUNDREL, n. *skown'drĕl* [possibly may be a corruption of an original form *scumbrel*—from OE. *scumber,* to dung: comp. Scot. *scunner,* to shudder, to disgust: AS. *scunian,* to shun—*scoundrel,* according to Skeat, having the primary meaning of 'a loathsome rascal']: a low, petty villain; a man without honor or virtue; an unprincipled fellow; a rascal: ADJ. low; base. SCOUN'DRELISM, n. *-ĭzm,* the state of being a scoundrel; rascality.

SCOUR, v. *skowr* [Ger. *scheuern,* to scour: Dan. *skure;* O.It. *scurare;* OF. *escurer,* to scour, to cleanse: comp. Gael. *sgur,* to scour, to cleanse]: to clean or brighten by rubbing; to clean from grease or dirt, as articles of dress; to search thoroughly in order to take or drive away; to pass swiftly over, as water; to purge or be purged excessively; to clean thoroughly; to run with great eagerness

and swiftness, as to *scour* the country; to rove; to range: N. a kind of diarrhea or dysentery in cattle. SCOUR'ING, imp.: N. a rubbing or cleansing; excessive looseness; the business of a scourer. SCOURED, pp. *skoword.* SCOUR'ER, n. *-ėr*, one who cleanses cloth, etc., as his trade; also, *formerly*, a footpad. SCOURING-DROPS, a mixture of oil of lemons with oil of turpentine used for removing grease-spots from silk.

SCOURGE, n. *skėrj* [F. *escourgée*, a thong, a scourge: It. *scuriata*, a scourging—from L. *excoriārĕ*, to flay—from *ex*, off; *corĭum*, skin: comp. Bret. *skourjez*, a whip, a rod: Gael. *sgiùrs*, to scourge, to whip]: a lash; a whip; an instrument of punishment or discipline; any severe national affliction or visitation, as a famine or a plague; the person or thing that afflicts: V. to lash with a whip or rod; to punish with severity; to chastise; to afflict greatly. SCOURG'ING. imp.: N. punishment with a scourge; chastisement. SCOURGED, pp. *skėrjd.* SCOURG'ER, n. *-ėr*, one who scourges.

SCOUT, n. *skowt* [OF. *escoute*, a spy—from OF. *escouter;* It. *ascoltare;* L. *auscultārĕ*, to listen]: one sent before an army, or in advance of settlers or explorers, to ascertain the presence or movements of an enemy; at *Oxford*, a man-servant in the colleges; in *cricket*, a fielder: V. to move about privately to observe the positions and motions of an enemy.

SCOUT, v. *skowt* [Scot. *scout*, to pour forth any liquid forcibly: Icel. *skúta*, a taunt—closely allied to SHOOT (q.v.)]: to sneer at; to reject disdainfully; to treat with contempt. SCOUT'ING, imp. SCOUT'ED, pp.

SCOVEL, n. *skŭv'ĕl* [F. *écouvillon*, a scovel—from L. *scopæ*, a broom: W. *ysgubell*, a mop—from *ysgub*, a broom]: a mop for sweeping a baker's oven.

SCOW, n. *skow* [Dan. *schouw*, a ferry-boat]: a large flat-bottomed boat, used as a lighter.

SCOWL, n. *skowl* [Dan. *skule*, to cast down the eyes: Dan. *skiul;* Icel. *skjól*, cover, shelter: AS. *sceól-eáge*, squint-eyed]: a deep angry frown by depressing the brows; a look of sullenness or gloomy anger; gloom: V. to wrinkle the brows in frowning; to assume a severe angry look; to look gloomy; to frown. SCOWL'ING, imp.: ADJ. sullen-looking; frowning. SCOWLED, pp. *skowld.* SCOWL'ER, n. one who. SCOWL'INGLY, ad. *-lĭ.*

SCRABBLE, v. *skrăb'bl* [see *scrape*, of which *scrabble* is a frequentative: Bret. *scraba;* Dan. *skraḃe*, to scrape or scratch]: to scrawl; in *OE.*, to scratch with the nails; to scramble; to feel about with the hands.

SCRAG, n. *skrăg* [Fris. *skrog*, a scrag: Dan. *skrog*, the hull of a ship, a carcass: Norw. *skrekka*, to parch, to shrink: Low Ger. *schräkel*, a stunted, misshapen thing: Gael. *sgreag*, to shrivel]: a body which is nothing but skin and bones; anything lean and rough. SCRAG'GED, a. *-gėd*, or SCRAG'GY, a. *-gĭ*, lean and bony; rough; an irregular broken surface, as a *scraggy* hill; lean; rugged. SCRAG'-

GEDNESS, n. *-gĕd-nĕs*, or SCRAG'GINESS, n. *-gī-nĕs*, the state or quality of being scragged or scraggy; leaness; roughness. SCRAG'GILY, ad. *-lĭ*. SCRAG OF MUTTON, the bony part of the neck of a sheep: see CRAG 2.

SCRAMBLE, v. *skrăm'bl* [prov. Eng. *scramb*, to pull, or rake together with the hands: Sw. *skramla*, to clash]: to climb by using the hands and feet; to strive to obtain eagerly and tumultuously in a competition with others; to contend with others in catching or seizing any desired object: N. the act of climbing by the hands; an eager and tumultuous competition or contest with others for any desired object. SCRAM'BLING, imp.: N. act of one who scrambles. SCRAMBLED, pp. *skrăm'bld*. SCRAM'BLER, n. *-blĕr*, one who scrambles.

SCRAN, n. *skrăn* [Icel. *skran*, refuse: Gael. *sgrath*, to peel, to pare; *sgrathan*, peelings, parings]: in *OE.* and *slang*, the peelings or parings; broken victuals. SCRANNEL, a. *skrăn'nĕl*, in *OE.*, pared or peeled; scraped; harsh. SCRANNY, a. *skrăn'nĭ*, thin; poor; miserable.

SCRANCH, v. *skrănsh* [of imitative origin: Dut. *schransen*, to scranch: Ger. *schranzen*, to eat greedily: Eng. *craunch, crunch, scrunch*]: to grind with the teeth, and with a crackling sound; to craunch.

SCRANTON, *skrăn'ton:* city, cap. of Lackawanna co., Penn.; on the Lackawanna river, and on the Delaware and Hudson Canal Co.'s, the Delaware Lackawanna and Western, the New York Ontario and Western, and the New Jersey Central railroads; 18 m. n.e. of Wilkesbarre, 149 m. w.n.w. of New York, 167 m. n. of Philadelphia; 25 sq. m.; known as 'the electric city.' It is in the northern geological field or basin of the state and in the Wyoming region, and owes its rapid development to the rich anthracite coal-veins that underlie it, and to the industries dependent on coal mining. The quality, accessibility, and apparently large quantity of anthracite coal in and about the village of Slocum induced George Whitefield Scranton, then manufacturing iron in N. J., to remove thither and erect some furnaces for smelting ore with this coal. He settled in Slocum 1840 and with his brother Joseph Hand Scranton (q.v.) erected a smelting plant the same year. This was the beginning of the great iron and steel industry of the city; and the enterprise of the two brothers was publicly acknowledged by changing the name of the village from Slocum to Scranton, and it was chartered as a city 1856. Abundance of coal, lumber, and water, and adequate facilities for transportation, have given S. high rank as a manufacturing city. In 1880 $4,470,631 were invested in manufacturing enterprises; in 1900, more than $19,000,000. The Board of Trade with its three branches and the citizens generally offer important inducements for the location of new industries, and the city govt. has fixed a nominal valuation for new manufacturing establishments—$100 for the first 10 years. The principal industries, besides coal mining 1900 were the manufacture of steel rails, stationary and hoisting engines, mining machinery, steam-boilers, locomotives, cars, steel

car-wheels, electric motors, steel tubes, edge-tools, foundry products, brass goods in large variety, carriages, leather, stoves, woolen goods, glass-works, cigars, and beer and ale. For reasons of an economic nature the rolling and rail mills have in later years been taken elsewhere, but the other industries continue in active operation, and still more diversified ones have been introduced, manufacturing articles of various materials, including silk and silk goods, under and outer wear, buttons, lace curtains, pianos, pumps, etc. Steam heating by the district plan is supplied on a large scale to the business and many residential sections, by a private company. In addition to much Scranton capital invested in all parts of the country, other local interests are cared for by 14 banking institutions, and sundry building and loan associations. Local newspapers, four daily and eight weekly, and numerous monthly and other publications are regularly issued. Among notable buildings are the Oral School for the Deaf, U. S. Post Office, Municipal Building, Co. Court house (cost $250,000), new Co. Jail (cost $200,000), Acad. of Music, State Armory, Moses Taylor Hospital, Free Public Library, St. Patrick's Cathedral, many other fine churches, and the Home for the Friendless. More than 15,000 children are enrolled in the public schools, and the city owns school property valued at more than $900,000. William Connell gave the city 20 acres of ground on the s. side for a public park, which had long been needed, and the city agreed to improve and maintain the park. There are many pretty squares and driveways. The municipal area is practically 20 square miles, divided into 21 wards. There are 165 miles of streets, avenues, and courts, of which 22 miles are paved; and the sewer system measures 65 miles. Public lighting is by electricity, at a cost of nearly $60,000 per annum; the police department costs annually not less than $65,000, and the fire department $75,000. The school enrollment exceeds 18,000 pupils, and annual expenditures for public education are more than $600,000. The largest and best known correspondence school in the world, and some others, had their origin and are in operation in Scranton. Assessed property valuation in 1903 aggregated close to $64,000,000. Average annual death rate is less than 16 per thousand, being reported as but 14.33 for the year 1903. Scranton is one of the few large cities in the United States having an almost unlimited water supply, though not controlled by the city. The water is soft and pure, impounded from mountain streams and a large, well-protected watershed. It is delivered by gravity from several reservoirs and a large artificial lake. The daily water consumption is nearly or quite 25,000,000 gallons, while an average of about 5,000,000,000 gallons is kept in store the major part of the year. Census reports of its population are as follows: (1860) 9,223; (1870) 35,092; (1880) 45,850; (1890) 75,215; (1900) 102,026; (1910) 129,867.

SCRANTON, *skrăn'ton*, JOSEPH HAND: 1813, June 27—1872, June 6; b. Madison, Conn. After serving as a clerk in New Haven and managing business interests for some time in Ga., he removed to Penn. and settled in the Lackawanna valley, where with two brothers, George W. S., Selden F. S., and a brother-in-law, Joseph C. Platt, he established the coal and iron interests of the region, and practically founded the city which bears his name and which at the time of his death had about 50,000 inhabitants. He held the various positions of manager, supt., and pres. of the Lackawanna Iron and Coal Company, was a railroad pres., and was prominently connected with the banks and manufactures of the city. He died at Baden-Baden, Germany.—His brother GEORGE WHITEFIELD S. (1811, May 11—1861, Mar. 24; b. Madison, Conn.) removed to N. J. when 17 years of age, worked as a teamster, and afterward was clerk in a store; became an iron manufacturer 1839, and joined his brother Joseph H. S. 1840 in this business on the site of the present city of Scranton. He was for a long time pres. of the Cayuga and Susquehanna and the Lackawanna and Western railroads, and was a member of congress 1859–61. He died at Scranton.

SCRAP, n. *skrăp* [Icel. *skrap*, scraps, trifles: Dan. *skrab*, refuse, rubbish (see SCRAPE 1)]: a small piece broken off or left over; a fragment; a short extract, as from an author; a print or small picture. SCRAPPY, a. *skrăp'pĭ*, consisting of scraps. SCRAP-BOOK, a bound blank-paper book for the preservation of short literary extracts and prints. SCRAP-IRON, cuttings and parings of ironwork, and other old and waste iron (usually malleable), collected to be worked anew in the puddling furnaces. The welding of small fragments of iron together gives greater strength than is found in large masses—the fibre being thus much more interwoven in every imaginable direction.

SCRAPE, v. *skrāp* [Norw. *skrapa*, to make a harsh sound, to grate; *skraaba*, to creak: Icel. *skrapa*, to creak or grate: Dut. *schrapen*, to scratch or scrape: Dan. *skrabe*, to scrape]: to rub or clean the surface of a thing with something rough, sharp, or edged; to collect or gather; to erase or rub out; to act on a surface so as to produce a grating noise; to play a violin badly; to make an awkward bow: N. a rubbing over with something that roughens or removes the surface; the effect produced by rubbing; an awkward bow. SCRA'PING, imp. SCRAPED, pp. *skrāpt*. SCRAPER, n. *skrā'pĕr*, a raised flat piece of iron placed at a door, on which to scrape shoes or boots in wet weather; any instrument for scraping; a sorry fiddler; a miser. SCRA'PINGS, n. plu. *-pĭngz*, leavings gathered together. To SCRAPE TOGETHER, to collect by small gains or savings. To SCRAPE ACQUAINTANCE, to make one's self acquainted, as with a person; to curry favor—a phrase which arose from the practice of *scraping* with the one foot on the floor when bowing

SCRAPE, n. *skrāp* [see SCRAPE 1: Sw. *skrapa*, to reprimand: Norw. *skrapa*, to get on with difficulty]: a situation of difficulty, perplexity, or distress.

SCRATCH, n. *skrăch* [Dut. *krassen*, to scratch, to scrape: Dan. *kradse;* Sw. *kratsa*, to scrape: Icel. *krassa*, to scratch: F. *gratter*, to scratch]: a slight, rough surface-wound by rubbing with anything pointed or ragged; laceration with the nails; a slight, rough, lined mark on anything; a line across a prize-ring up to which the combatants are brought when they begin to box—hence, in *familiar language*, test, trial, or proof, appearance when expected; a calcareous earthy or stony substance which separates from sea-water and incrusts the bottoms and sides of salt-pans and boilers: V. to slightly mark or tear the surface of anything, as by the nails or by claws; to dig or excavate with the claws; to rub with the nails; to strike a horse's name out of the list of runners in a particular race. SCRATCH'ING, imp.: N. the act of one who scratches. SCRATCHED, pp. *skrăcht*. SCRATCHES, n. plu. *skrăch'ĕz*, chaps or ulcers between the heel and pastern-joint of a horse. TO SCRATCH OUT, to erase; to rub out. TO BRING TO THE SCRATCH, to bring to the test or proof of courage. TO COME UP TO THE SCRATCH, to fight or prepare to fight—in allusion to the line scratched on the ground, at which the fighters must place their toes while they stand opposite each other waiting to begin the contest—see above. SCRATCH RACE, a race where any horse may run without restriction; an informal race; a boat-race where the crews are drawn by lot, as at *Cambridge*. SCRATCH CREW, a ship's crew gathered together at random without regard to character or qualifications. SCRATCH-WIG, a kind of small wig. SCRATCH-WORK, n., in *arch.*, a species of fresco, consisting of a colored plaster laid on the face of a building, etc., and covered with a white one, which being scratched through to any design, the colored one appears and forms the contrast. OLD SCRATCH, the devil; the house-demon of the North; hence, a mean, miserly old man.

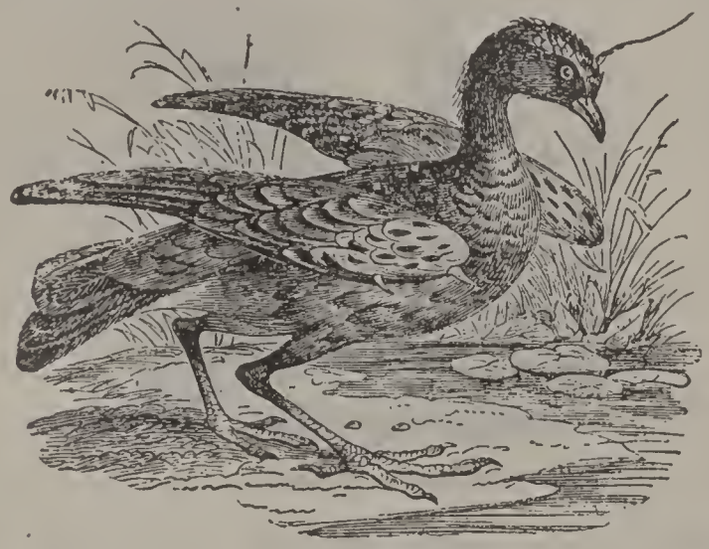
SCRAWL, n. *skrawl* [perhaps a corruption of SCRABBLE, which see: comp. Dan. *kravle*, to scrawl]: bad or hasty writing: V. to write or draw hastily or imperfectly; to scribble. SCRAWL'ING, imp.: ADJ. writing illegibly. SCRAWLED, pp. *skrawld*. SCRAWL'ER, n. *-ĕr*, one who scrawls.

SCRAY, n. *skrā* [W. *ysgräen*, a sea-swallow]: the sea-swallow or tern.

SCREAK, v. *skrēk* [Dan. *skrige*, to screak: another form of CREAK]: synonymous with CREAK, which see.

SCREAM, n. *skrēm* [Sw. *skräma;* Dan. *skræmme*, to scare: W. *ysgarm*, outcry]: a shrill quick cry, indicating sudden terror or pain; a shriek; the shrill cry of some birds: V. to cry out shrilly from sudden terror or pain. SCREAM'ING, imp.: ADJ. having the nature of a scream; shrill or sharp; causing screams of laughter, as a farce: N. the act of crying out with a shrill cry from fear or agony. SCREAMED, pp. *skrēmd*. SCREAM'ER, n. *-ĕr*, one who screams: in *slang*, something very great, as a lie.

SCREAM'ER (*Palamedea*): genus of birds allied to the Jacanas (q.v.); named from its loud harsh cry. The bill is rather short, conical, curved at the extremity; there is a bare space around the eyes; the toes are long; each wing is furnished with two strong spurs. The HORNED S., or KAMICHI (*P. cornuta*), inhabits swamps in Brazil and Guiana, and feeds on the leaves and seeds of aquatic plants. It is of blackish-brown color, nearly as large as a turkey, and has somewhat the appearance of a gallinaceous bird. From the head, a little behind the bill, rises a long,



Horned Screamer (*Palamedea cornuta*).

slender, movable horn, of which no use has been conjectured. The spurs of the wings are supposed to be useful in defense against snakes and other enemies.—Closely allied to this genus is the genus *Chauna*, or *Opistolophus*, to which belongs the CHAUNA, or CRESTED S. (*C.* or *O. chavaria*), native of Brazil and Paraguay, whose head has no horn, but is adorned with erectile feathers. The plumage is mostly lead-colored and blackish. The wings are armed with spurs. It is very capable of domestication, and is sometimes reared with flocks of geese and turkeys, to defend them from vultures, as it is bold and powerful.

SCREECH, n. *skrēch* [Dan. *skrige;* Sw. *skrika*, to cry, to scream: W. *ysgrêch*, a scream: Gael. *sgreuch*, to screech]. a shrill loud cry, more acute and piercing than a scream; a harsh horrid cry: V. to utter a loud discordant and piercing cry, like that of the owl. SCREECH'ING, imp.: N. the act of one who screeches. SCREECHED, pp. *skrēcht*. SCREECH-OWL, the night-owl—so called from its peculiar, harsh, disagreeable cry.

SCREED, n. *skrēd* [AS. *screádian*, to shred; *screáde*, a strip. comp. Gael. *sgread*, a shriek, a screech]. in *Scot.*, any loud shrill sound; a rent; a strip torn off; a long harangue or tirade, generally of a disagreeable nature; a long discourse or recital in poetry or prose SCREED'ED, a. entertained with a long harangue or tirade. SCREEDS, n. plu. *skrēdz*, in *plaster-work*, ledges of lime and hair, about 6 or 8 inches broad, dividing a surface about to be plastered into compartments, and forming gauges for the rest of the work; wooden rules for running moldings.

SCREEN, n. *skrēn* [OF. *escran;* F. *écran,* a screen. Ger. *schranne,* a railing: Pol. *schronic,* to shelter, to screen Bohem. *schraniti,* to guard; *schrana,* a screen]: a light movable partition for protecting from cold or light, or for partially intercepting the heat of a fire; anything that shelters or affords concealment; a partition separating a portion; a partition dividing one part of a church from another (see below): a sort of drapery for concealment; a long riddle or sieve which wards off the coarser particles,

Builder's Screen.

and prevents them passing through, as in coal, gravel, sand, etc.: V. to shelter; to conceal; to hide; to protect; to separate, as by a screen or riddle. SCREEN'ING, imp.: ADJ. sheltering; protecting; sifting, as coals from dross. SCREENED, pp. *skrēnd.* SCREEN'INGS, n. plu. *-ĭngz,* the refuse-matter left after sifting coals, ashes, etc. SCREENED COAL, coal separated from the dust and dross.—SYN. of 'screen, v.': to hide; cover; conceal; shelter; protect; defend; shield; secrete; sift; riddle.

SCREEN, in Architecture: partition of wood, stone, or metal work. It is frequent in great churches, where it shuts off chapels from the nave, separates the nave from the choir, and in many cases incloses the choir. Such screens are often much ornamented, the lower part being solid, and the upper very often perforated. The Rood-screen (see ROOD) is that on which most labor is usually bestowed. In England, many beautifully carved ancient screens in stone, enriched with pinnacles, niches, statues, etc., remain, e.g., at York, Lincoln, Durham, etc.; and specimens in wood, carved and painted, are common in parish churches. In France, the screen round the choir is sometimes the subject of beautiful sculptures, as at Amiens and Paris. In Halls (q.v.) there was usually a wooden screen at one end to separate the entrance-door and a passage from the hall. Over this was a gallery. The term 'Screen of Columns' is applied to an open detached colonnade.

SCREES, n. plu. *skrēz* [Scot. and prov. Eng.]: in *geol.,* a talus, accumulations of loose stones at the base of a cliff or precipice.

SCREEVE, or SCREVE, v. *skrēv* [Ger. *schreiben;* Dut. *schrijven;* L. *scribĕrĕ*, to write: F. *écrivain*, a writer]: to write; to mark or brand with letters. SCREEVING, imp. *skrēv'ĭng:* N. marking or branding with letters. SCREEVED, pp. *skrēvd.*

SCREW, n. *skrô* [OF. *escroue;* Ger. *schraube;* Sw *skruf;* Dan. *skrue*, a screw]: bolt or bar of metal or wood, generally of small size, with a spiral thread or ridge, called the exterior or *male screw*—a socket or tube with the spiral thread indented is called the interior or *female screw*—used for fastening; one of the mechanical powers, commonly called the *screw and nut* (see below): a mean niggardly person; a person who screws down prices disreputably; a jade, as applied to a horse: V. to turn or move by a screw; to press; to squeeze; to fasten with a screw; to deform by contortions, as the face; to oppress by exactions; to twist; to beat or take down prices disreputably. SCREW'ING, imp. SCREWED, pp. *skrôd:* ADJ. in *slang*, intoxicated. SCREW'ER, n. *-ĕr*, one who screws. SCREW-BOLT, a bolt or short rod of iron with a screw at one end and a flat head at the other. SCREW-DRIVER, instrument resembling a blunt chisel for turning screws, so as to drive them in or draw them out. SCREW-JACK, a contrivance for raising great weights through short lifts by means of a screw, or by a combination of toothed wheels. SCREW-NAILS, screws with notched heads, much used by carpenters for fastening their work. SCREW-PILES, piles held firmly in the ground by a peculiar kind of screw at the lower extremities, used for supporting light-houses, etc. SCREW-PLATE, a thin plate of steel having a series of holes with internal screws, used for forming external or male screws on small bars of iron. SCREW-PRESS, a press in which the force is applied by means of a screw. SCREW-PROPELLER, shaft of iron furnished with broad spiral wings, fitted into the lower part of the stern of a ship, and made to revolve by steam, used in propelling a ship instead of paddles (see below). SCREW-STEAMER, a steamer propelled by a screw and not by paddle-wheels. SCREW-STONES, in *geol.*, a familiar name for the hollow siliceous casts of encrinite stems, frequently occurring in the cherts and rotten-stones of the carboniferous limestones, resembling the threads of a screw. SCREW-TAP, the cutter for forming internal screws. SCREW-VALVE, a stop-cock having a valve moved by a screw instead of a spigot. SCREW-WRENCH, wrench or lever for turning large screws (see below). SCREWING-MACHINE, a machine for forming screws. ENDLESS or PERPETUAL SCREW, a screw used to give motion to a toothed wheel. LAG SCREW, a bolt having a nut, a square shank, and a round head. MICROMETER SCREW, a screw with fine threads, used for the measurement of very small spaces. OLD SCREW, one who is mean and sparing in his payments, grudging at parting with any money. RIGHT-AND-LEFT SCREW, a screw of which the threads upon the opposite ends run in different directions. SCREW OF TOBACCO, a small twist of tobacco rolled up in paper. TO SCREW DOWN, to fasten down by means of screws. TO SCREW IN, to force in by turning or

twisting. To SCREW OUT, to press out; to extort. To SCREW UP, to force; to bring by violent pressure. To PUT ON THE SCREW, to press for payment constantly; to exercise influence to attain a certain end. To PUT UNDER THE SCREW, to subject to a severe trial. A SCREW LOOSE, something wrong or amiss. MALE and FEMALE SCREWS, screws having the threads on the outside and inside respectively, the former fitting into the latter.

SCREW: one of the Mechanical Powers (q.v.), modification of the Inclined Plane (q.v.), as may be shown (fig. 1)

Fig. 1.

by wrapping a piece of paper in the form of an inclined plane round a cylinder. In the screw, the spiral line, formed by the length or slope of the plane, is raised up in a ridge, and a lever is attached for the purpose of working it, so that the S. is really a compound machine, combining the lever and the inclined plane. It may be used as an instrument for penetration, e.g., the auger, gimlet, etc., or for producing pressure, the latter being its most important application as a mechanical power. For this purpose, it is made to work in a 'female screw' or *nut* (a hollow cylinder grooved on the inside so as to correspond to the threads of the S.); the nut is then firmly fixed in a massive frame (fig. 2), and the revolution within it of the S. causes the lower extremity of the S. to advance or recede. The principle of application is the same as that of an inclined plane pushed further and further under a heavy body so as to raise it up. Now in the inclined plane, P. the power or force, is to W, the weight raised or the pressure overcome, as the height of the plane to its base; i.e., in the screw, as the distance between two threads is to the circumference of the cylinder. But as the twist is not applied at the circumference of the cylinder directly, but by means of a lever, it follows that the power applied, P, is to W as the distance of two threads to the circumference described by P at the end of the lever. Hence the power of the S. is increased by diminishing the distance between the threads; but as this cannot be effected without weakening the instrument, there is an evident limit to the increase of power in this way. The power can be increased also by lengthening the lever; but the best mode is that proposed by Hunter (*Phil. Trans.*, XVII.), in which are employed two screws of different fineness, the coarser of them hollow and grooved, to act as a nut for the other. The outer and coarser S. is the one to which the power is applied by a lever, and it is adjusted in the manner before

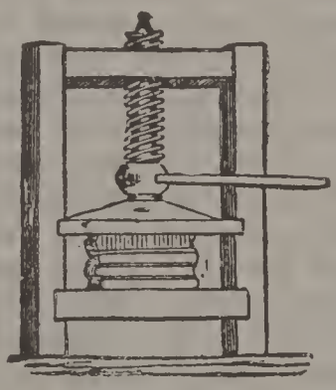


Fig. 2.

described; the inner is so fastened as to be capable of vertical motion only. When the outer S. is turned so as to move its extremity downward, the inner S. moves upward, but not to the same amount; thus, if the outer S. have 6 threads to the inch, and the inner one 7, one turn of the outer screw depresses it $\frac{1}{6}$ of an inch; but as the inner one rises $\frac{1}{7}$ of an inch, the whole descent of the point which produces pressure is only $\frac{1}{6} - \frac{1}{7}$, or $\frac{1}{42}$ of an inch; hence the pressure applied is 7 times greater than could be given by the outer, 6 times greater than could be given by the inner S., and equal to what would be given by a S. with 42 threads to the inch, with the same power applied. The advantage of Hunter's S. is that the threads may be of any thickness, and consequently each S. of any strength that may be desired, provided the difference be small enough. The S. is one of the most powerful of the mechanical powers, but the friction generated by it amounts to about one-third of the force applied.

In carpentry and structural mechanics the S. is used to an enormous extent for joining different parts of structures, and is familiar to everyone. Till 1836 screws were hand-made. At that time Thos. W. Harvey introduced machinery which did part of the work, and 1846 fully automatic machinery was introduced. Originally wood screws had blunt ends, and a hole had to be made for them even in soft wood. In 1836 Harvey constructed gimlet-pointed screws, but it was ten years before they were widely used. Mr. Harvey's son, Hayward A. Harvey, has in recent years invented improved machinery, on new principles, for the manufacture.

In mechanics of metals where the S. does not form its own matrix in which to be inserted, but where the hole has to have a thread specially cut within it, much confusion has been experienced by the lack of a standard thread. This desirable factor has been to a great extent attained at present, largely through the efforts of Whitworth.

The nomenclature of screws is now very extensive. The inclination of the thread is called the pitch, and is defined by the number of threads to the inch or other unit of length; the direction of the twist is called right-handed if as in ordinary screws, or left-handed if the reverse; the cylindrical or entering S. is called the male, and the threaded aperture into which it enters is called the female S.—See also SCREW-PROPELLER.

SCREW PINE (*Pandanus*): genus of plants of nat. order *Pandanaceæ*, natives of the tropical parts of the east and of the South Sea Islands. Many are remarkable for their adventitious roots, with large cup-like *spongioles*, which their branches send down to the ground, and which serve as props. Their leaves are sword-shaped, with spiny edges, and are spirally arranged in three rows. In general appearance, when unbranched, they resemble gigantic plants of the pine-apple, whence their popular name. *P. odoratissimus* is a widely diffused species; a spreading and branching tree 25 ft. high, much used in India for hedges,

though it occupies much ground. In s. India, it is called the Kaldera Bush. It grows readily in a poor soil, and is one of the first plants to appear on newly-formed islands in the Pacific. The male flowers are in long spikes, the female flowers in shorter branches. The flowers are frequently gathered before expanding, and boiled with meat. Their delightful and very powerful fragrance has made the plant a favorite everywhere, and it is the subject of continual allusions in Sanskrit poetry, under the name *Ketaka.* Oil impregnated with the odor of the flowers, and the distilled water of them, are highly esteemed East Indian perfumes. The seeds are eatable; and the fleshy part of the drupes, which grow together in large heads, is

Screw Pine (*Pandanus odoratissimus*).

eaten in times of scarcity, as is the soft white base of the leaves. The terminal buds are eaten, like those of palms. The spongy and juicy branches are cut into small pieces as food for cattle. The leaves are used for thatching, and for making a kind of umbrella common in India, and their tough longitudinal fibres for making mats and cordage. The roots are spindle-shaped, composed of tough fibres; they are therefore split up by basket-makers, and used for tying their work.—More valuable, however, as a fibrous plant is an allied species, *P. sativus* or *P. Vacoa,* the VACOA of Mauritius which, if permitted, grows to a height of about 30 ft., but from continual cropping of its leaves, is usually dwarfed to six or ten ft. The fibres of its leaves are used for making the *Vacoa bags,* a considerable article of export from Mauritius, rivalling in cheapness and usefulness the Gunny Bags of India. The leaves are cut every second year, and each plant yields enough to make two large bags. Immediately on being cut off, the leaves are split into fillets, three or four ft. long, nearly an inch broad at the base, but tapering to a point. One of these will support a bag of sugar, of about 140 lbs., without breaking. The fibrous aërial roots of the Vacoa are used for making paint-brushes for coarse purposes.

SCREW-PROPEL'LER, or SCREW, in Marine Engineering: a Screw (q.v.) with the narrow thread exaggerated into a broad, thin plate, and the cylinder diminished to a

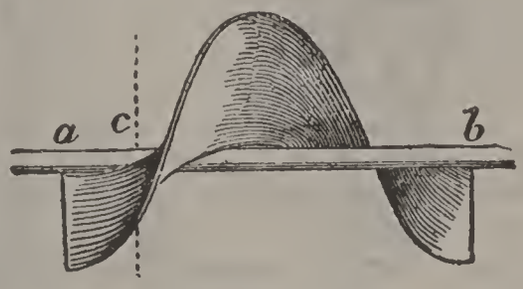


Fig. 1.

mere spindle. One complete turn of such a S. is shown in Fig. 1. Now, if a S. of this form were turned round in an unyielding substance, as wood, it would for each turn advance as much as the centre of the blade (or thread) had moved along the spindle in forming the screw, i.e., the distance *ab*. If, on the other hand, the S. itself were prevented from moving longitudinally, and the piece of wood *not* fixed, the latter would be compelled to advance along the S. the same distance *ab*. When the S. is fixed beneath a ship, and made to revolve in the water, the case lies between the two just supposed, the S. moves forward, and with it the ship, and the water in which it has been working moves backward. The backward motion should only be small proportionately, and the ratio between it and the sum of the backward motion of the water and the forward motion of the ship is called the *slip*, which in well-designed vessels has a value of from 0.1 to 0.25.

It is obvious also that on the same spindle there may be more than one blade, provided that all the blades have the same pitch or rate of progression along the spindle (in Fig. 1, *ab* is the *pitch* of the screw). Screws have thus been formed with two, three, four, and six blades or arms; but the usual form is two blades for ships-of-war, and three or four blades in the merchant-service.

If the S. be cut off before attaining the length *ab* of a whole convolution, as at *c*, the portion *ac* will still retain all the properties of the S. In the earlier attempts, screws were tried of the length of a whole convolution, or even two whole turns; but experiment has since shown that this length is a disadvantage. The best results are obtained when the sum of the lengths, measured parallel to the centre line of the shaft, of all the blades, is equal to about 0·4 of the pitch. This holds equally good for two, three, or four bladed propellers, so that if n equals the number of blades, then the length of one blade, or *ac* would be expressed by the equation $ac = \frac{0{\cdot}4\ ab}{n}$. A four-bladed S. of this kind, and of a form very generally used in merchant vessels, is shown in Fig. 2.

The following are the technical terms applied to the screw-propeller: The *shaft* is the cylindrical axis on which the S. revolves, and is the medium for communi

cating to it the power of the engine; the *blade* is the thread of the S.; the *pitch*, the length of shaft on which the blade would make one complete turn; the *diameter* is

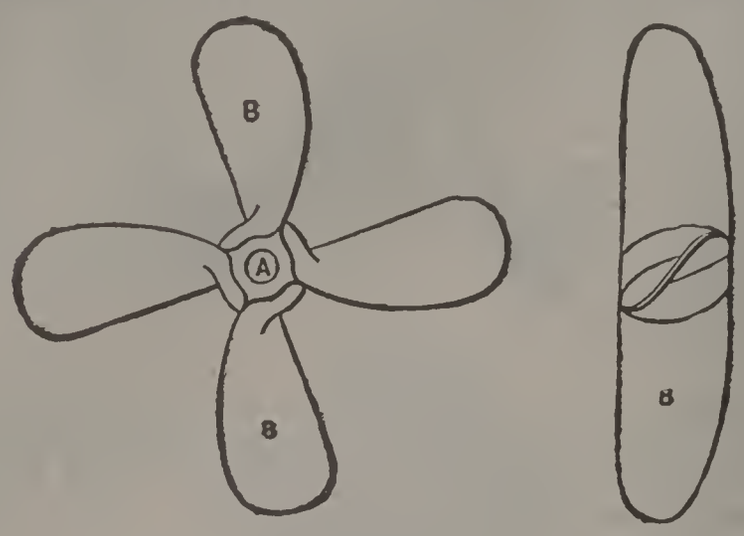


Fig. 2.

the distance between the tips of opposite blades; and the *length* is the distance from the front to the back edge of blade projected on a fore-and-aft plane.

The application of the S. to propulsion of a vessel is not new. In 1802, Dr. Shorter, English mechanician, produced motion by its agency; but his discovery was valueless, as the steam-engine had not then been practically applied to navigation Those who first employed Watt's engine on board ship adopted the paddle-wheel, the success of which turned attention from the screw for nearly 30 years. At length, 1832, B. Woodcroft patented a screw-propeller with an increasing pitch; and four years later, F. P. Smith patented a S. making two whole turns, which he reduced, 1839, to one whole turn. In 1837, he and Capt. Ericsson, American inventor, brought the matter practically forward on the Thames, where a small screw-steamer 45 ft. long, 8 ft. broad, and of 27 inches draught, towed the *Toronto* of 630 tons against tide at 4½ knots an hour. In 1839, an American gentleman had the *Robert Stockton* built for him by Messrs. Laird, with which he reached America. The British admiralty, however, gave no countenance to the new propeller, until the success of the *Archimedes*, built 1838 (232 tons and 80 horse power), which was exhibited at the principal ports, rendered opposition no longer possible. Meanwhile, 1838, James Lowe had shown that the length of the S. should not exceed $\frac{1}{6}$ of the pitch; and after successive trials, the S. of the *Rattler* (admiralty experimental vessel) was cut down from 5 ft. 9 inches to 1 ft. 3 inches. These experiments established the S. as a rival to the paddle-wheel; and its advantage for ships of war became incontestable, as, from the entire submergence of the propeller, and consequent lowness of its engines in the ship, the chances of their injury from an enemy's shot were greatly reduced. It was found valuable also as an auxiliary in sailing-vessels. Its use for sea-going ships is now nearly universal.

Several varieties of S. have been introduced. In one long in use in the British navy, invented by R. Griffiths, the blades, instead of rising from a small *boss*, as in Fig. 2, spring from a hollow sphere occupying one-third the screw's diameter. This arrangement was adopted because experiment proved that the central portions of the blades of the ordinary S. absorb about 20 per cent. of the propelling power, while they produce little useful effect, from the fact that at that part (especially in screws of a coarse pitch) the blade is nearly in a line with the shaft and acts at right angles on the water, causing a disturbance of only that portion on which the outer and more powerful end of the blade operates. The globe, on the other hand, revolves with little friction. A further improvement was effected by bending the tips of the blades a little over backward, so that the face of the blade striking the water was partly convex. The older propellers had blades which increased in width uniformly from boss to tip. These were found to create much vibration in the ship, and the 'leading' corner is therefore rounded away as shown in Fig. 2. This is done also in Griffith's propeller, but he probably carries the principle to excess in cutting away also the 'following' corner, and so lessening the effective surface of the blade. A propeller invented by Hirsch, and known by his name, has been successfully tried by the admiralty.

One difficulty in the use of the S. as an auxiliary in sailing-ships is that in a good wind the S. seriously impedes the sailing. To prevent this, various devices are resorted to. In some cases, the S. is disconnected from the shaft, and left to revolve freely; in others, as in most ships of war, it is disconnected and hoisted altogether out of the water by means of an iron framework worked above the S. in a sort of well. Messrs. Maudsley have patented a 'feathering-screw,' which, by a simple apparatus, can, when the steam power is not required, have the blades turned into a line with the ship's keel, and the S. (which must be two-bladed) fastened in a vertical position. When thus treated, the S. is out of danger, and forms no impediment to the ship's progress.

The usual position for the S. is immediately before the stern-post, the shaft on which it revolves passing, parallel to the keel, into the engine-room. Many vessels have been built, especially naval cruisers, with two screws, one under each quarter. These have independent action, and as one can be reversed while the other goes ahead, great steering-power is imparted; so much so, that vessel constructed on this principle are said to be able to turn in their own length. For a given power, a twin-screw vessel draws less water, owing to the lessened diameter of the propellers, than an ordinary screw-steamer. As the action of the S. depends on the comparative immobility of the water in which it acts, it is necessary, for development of its full power, that it should be completely immersed, and that there should be nearly two ft. of water above the top of the upper blade. It follows from this

that, *ceteris paribus*, the screw-vessel will draw more water than the paddle-steamer; for in large steamers the S. is 15 to 18 ft. in diameter: in the *Great Eastern* it was 24. Several of the new armored cruisers, or 'commerce destroyers,' projected or built about 1891 for the remodelled U. S. navy, are to be provided with triple screws, the third screw being placed between and below the other two and 15 ft. further aft. Each screw will be operated by a triple expansion engine, and may be worked independently of the others.

As to comparative advantage of the paddle and S., under favorable circumstances, in ships of equal tonnage and power, there is little difference in speed or force. Before the wind, the paddle has a slight advantage; with the wind ahead, the resistance offered by the paddle boxes transfers the advantage to the S. Fastened stern to stern, the screw-ship drags the paddle-ship; but fastened bow to bow, the same result is not found. This is to be attributed to the loss of power in a paddle-ship when not in progress (see PADDLE-WHEEL) rather than to any actual superiority of the S. In a long voyage, however, the gain is distinctly with the S.; because the weight of fuel borne at starting sinks the paddles too low in the water, and probably its exhaustion at the end of the voyage deprives them of their proper dip; whereas, with ordinary management, the S. will always be immersed. Again, rolling deprives the paddle of much power; while pitching deprives the S. of its proper matrix; but the balance of loss in tempestuous weather is in favor of the S. In men-of-war the S. allows a clear broadside for the guns. On the other hand, in comfort to passengers, the advantage is with the paddle; for the rapid revolution of the heavy S. on a shaft extending half the ship's length, produces a continuous and unpleasant vibration; while the lower position of the engines and S. gives the vessel a deep roll. For lakes and rivers, where the water is smooth and the voyage of only a few hours, paddles are best, especially so when the water becomes often shallow or is choked with weeds, which would soon clog the screw: also in such navigation the construction with paddle wheels affords more facilities for handling freight.

In scientific language the motion of a vessel by means of a S. is said to be due to the forward reaction of the water in which the propeller revolves, upon the blades, and through them on the whole vessel. That this useful reaction may bear the largest possible ratio to the work done by the engine, it is essential that the form of the ship aft should be such as will secure that water shall always have free access to the forward side of the S. as the vessel goes along. Experiments show that if the propeller be worked, with a disk of the same diameter placed in front of it the vessel will not move forward at all, though the power given out by the engines remains as before.

See STEAM-NAVIGATION; STEAM-ENGINE.

SCREW-WORM: larva, or maggot, of a dipterous insect, *Lucilia macellaria,* found in all parts of the American continent; parasitic on man and animals. The mature insect is a little larger than *Musca domestica* (common house-fly); has a yellow head; 3 longitudinal dark lines on the thorax; abdomen yellowish-green. Though *Lucilia macellaria* is distributed throughout the United States, only in Texas is the S.-W. a serious evil. The insect deposits its eggs in wounds produced by whatever cause, as when cattle are gored or bitten, or torn by barbed wire, when they have undergone surgical operations; in short whenever the integument is injured: the eggs are deposited also in the natural openings of the animals' bodies: thus they are often found in the vulvæ of fresh cows. When hatched in wounds, the larvæ seem to attach themselves by their heads, and burrow under the skin. They grow steadily in size, making a hole in the flesh that grows larger day by day, and producing swelling and bleeding at the part. They attain full growth ($\frac{5}{8}$–$\frac{5}{6}$ in.) in about a week. Then they leave their 'host' and go into the ground, where they pass into the pupa state, and come forth as flies in 9–12 days. But in the mean time other eggs are deposited in the wound, and if the worms are not killed, they penetrate deeper and deeper into the tissues.

SCREW-WRENCH: tool for grasping the flat sides of the heads of large screws, such as are used in engines and other large works. The heads are usually octagonal

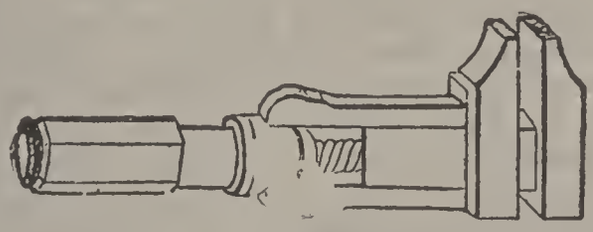


Fig. 1.

laterally, and the wrench is made of two portions like hammers sliding one upon the other (fig. 1), so that screw-heads can be grasped of different sizes, and the handle forms the lever by which they are turned round. The

Fig. 2.

screw-key (fig. 2) is only a more simple kind of wrench, which will act only on screws of two sizes, fitting the jaws at each end.

SCRIBBLE, v. *skrĭb'bl* [L. *scribĕrĕ*, to scratch marks on, to write: Ger. *schreibler*, a scribbler; *schreiben*, to write]: to write carelessly and illegibly; to scrawl; to fill with worthless writing: N. hasty or careless writing; a writing of little value. SCRIB'BLING, imp. *-blĭng:* N. the act of writing hastily and badly. SCRIB'BLED, pp. *-bld.* SCRIB'BLER, n. *-blĕr*, one who scribbles; a petty writer or author. SCRIB'BLINGLY, ad. *-lĭ.* SCRIBBLING-PAPER, damaged or inferior paper—also outsides.

SCRIBBLE, v. *skrĭb'bl* [Sw. *skrubba*, to scratch; *skrubbel*, a wool-card: Ger. *schrabbeln*, to card wool]: to card or tear coarsely with a wire comb. SCRIB'BLING, imp. *-blĭng:* N. the tearing or separating of wool preliminary to the final carding. SCRIB'BLED, pp. *-bld.* SCRIB'BLER, n. *-blĕr*, in a *manufactory*, one who attends to the scribbling; also, the machine used in the operation (see SPINNING).

SCRIBE, n. *skrīb* [F. *scribe*—from L. *scriba*, a scribe or clerk—from *scribo*, I write: It. *scriba*]: a clerk; a writer or secretary; an amanuensis; a copyist: among the *anc. Jews*, expounder of the law, and copyist of the same (see below).

SCRIBE, v. *skrīb* [L. *scribĕrĕ*, to scratch marks on, to write]: among *carpenters*, to mark or fit by a rule or compasses; to fit the edge of one board to that of another, so that the fibres of the one may be at right angles to those of the other. SCRIBING, imp. *skrī'bĭng:* ADJ. applied to the edge of a board when fitted upon any surface: N. the act of fitting one piece of wood upon another so that the fibres of both may be at right angles to each other. SCRIBED, pp. *skrībd.* SCRI'BER, n. *-bĕr*, a sharp pointed tool used by joiners for drawing lines; a marking-awl. SCRIBING-IRON, an iron-pointed instr. for marking casks and logs.

SCRIBE, *skrīb* (Heb. *Sof[illegible]r*. *Grammateus*, *Nomodidaskalos*): among the Jew[illegible]ginally a kind of military officer, whose business appears to have been the recruiting and organizing of troops, the levying of war-taxes, and the like. At a later period, especially at the time of Christ, S. had come to designate a learned man, a doctor of the law. Christ himself recognizes the scribes as a legal authority (Matt. xxiii. 2); they were the preservers of traditions, and formed a kind of police in the Temple and synagogues, together with the high-priests; and the people reverenced them, or were expected to reverence them. They were found all over Palestine, and occupied the rank and profession of both lawyers and theologians. Their public field of action was thus probably threefold: they were either assessors of the Sanhedrim, or public teachers, or administrators and lawyers. Many of these teachers had special class-rooms somewhere in the Temple of Jerusalem, where the pupils destined to the calling of a rabbi sat at their feet. The calling of a S. being gratuitous, it was incumbent on every one of them to learn and to exercise some trade. Those scribes who were not eminent enough to rise to the higher branches of their profession, to enter the Sanhedrim, to be practical lawyers, or to hold schools of their own, occupied themselves in copy

ing the Book of the Law or the Prophets, in writing phylacteries, contracts, letters of divorce, and the like. Their social position was naturally in accordance with their talents and their importance. The apostles, mostly simple unlettered men, not learned enough to be scribes, are promised to become 'scribes' of the kingdom of God, etc. See PHARISEES: HALACHA: HAGGADA: MIDRASH: MISHNA: TALMUD.

SCRIBE, *skrēb*, AUGUSTIN EUGÈNE: French dramatic writer: 1791, Dec. 24—1861, Feb. 20; b. Paris; son of a wealthy silk-mercer. Educated for the legal profession, he soon deserted it for dramatic authorship, scarcely more, however, than dramatic editing and adapting. His first piece, *Les Dervis*, written in conjunction with Germain Delavigne (bro. of Casimir Delavigne), was played 1811. After 1816 his success was decided. Pieces, chiefly vaudevilles, from his pen followed one another with astonishing rapidity; and in such demand were they at the hand of theatrical managers, that S. established a sort of dramatic manufactory, in which numerous *collaborateurs* were constantly at work under his supervision. His plots lack force; his dialogue is light and tripping; he is without originality in dealing with character; and his style is devoid of merits other than those that gain transient popularity. S. perfectly knew both stage machinery and the tastes of the public. He amassed great wealth. In his dealing with brother-authors he was a model of literary honor and generosity—giving them credit for their unconscious aid, and often liberal payment in money. Several of his pieces have been adapted for the English stage. S. wrote also novels, and composed the *libretti* for some well-known operas, including *Masaniello*, *Fra Diavolo*, *Robert le Diable*, and *Les Huguenots*. He was admitted a member of the French Acad. 1834.

SCRIBNER, *skrĭb'nĕr*, CHARLES: publisher: 1821, Feb. 21—1871, Aug. 26; b. New York. He was educated at New York Univ., and at Princeton, graduating 1840. His health not suiting a professional life, he undertook publishing; the firm name was Baker & S., afterward Charles S. & Co., and continued after his death as S., Armstrong & Co., until 1878, when it became Charles Scribner's Sons. Coincident since 1857, Scribner & Welford is a separate firm importing books, and another, S. & Co., published *Scribner's Monthly*, which was sold to the Century Co. 1881, but revived 1887 by Charles S.'s Sons as *Scribner's Magazine*. Charles S. died at Lucerne, Switzerland. His son, John Blair S., represented the family in the publishing firm from 1871 until his death, 1879, since which the firm is composed of two other sons, Charles S. and Arthur H. S. The house has always ranked high in the extent and character of its publications, which include many works of biblical exegesis, ecclesiastical history, religious essays, and such philosophical works as those of Pres. McCosh.—JOHN BLAIR S. (1850–79), named after his mother's father, John I. Blair, the capitalist, was educated at Princeton, and died in his native city, New York.

SCRIM, n. *skrĭm* [comp. Ger. *schirm,* a screen, a shade]: a thin, coarse cloth used for making window-curtains and for other purposes.

SCRIM, n. *skrĭm* [etym. doubtful; prob. for *scrimps*]: thin canvas glued on the inside of a panel to keep it from cracking or breaking: V. to grate; to creak.

SCRIMER, n. *skrī'mėr* [F. *cscrimer*—from It. *schermirc,* to fence]: in *OE.,* a fencing-master; a gladiator.

SCRIMMAGE, n. *skrĭm'āj,* or SCRUMMAGE, n. *skrŭm'āj* [F. *escarmouche;* It. *scaramuccia,* a skirmish]: an old spelling of SKIRMISH, which see; in *modern slang,* a general row or fight.

SCRIMP, v. *skrĭmp* [Ger. *schrumpfen;* Dan. *krympe,* to shrink: W. *crimpio,* to crimp]: to shorten; to limit or straiten; to make too small: N. a niggard; a miser: ADJ. short; scanty. SCRIMP'ING, imp. SCRIMPED, pp. *skrĭmpt.* SCRIMP'NESS, n. shortness; scantiness.

SCRINE, n. *skrīn* [L. *scrinĭum,* a chest or box]: in *OE.,* a secret repository; a shrine.

SCRIP, n. *skrĭp* [Low Ger. *schrap;* Fris. *skrap,* a pocket: Icel. *skreppa;* OF. *escharpe,* a wallet, a scrip]: the receptacle of what the beggar scrapes together; a small bag or wallet.

SCRIP, n. *skrĭp* [L. *scriptum,* a writing—from *scribĕrĕ,* to write]: piece of paper containing writing: in *finance,* certificate (usually about the size and appearance of a bank-note) of a person's right to receive a share or shares in a railway or other joint-stock undertaking: collectively, the whole issue of such certificates. Scrip is issued when the party signs a contract of copartnery, and is retained by such party until an act of the legislature, or some other formality, establishes the company, and authorizes the opening of regular books for entering the names of shareholders and the transfer of stock. In many instances, scrip is unauthorizedly sold, and made an object of speculation; the party to whom it was assigned, however, remains bound by the contract which he has subscribed, until relieved of his obligations by transfer in the company's books. Scrip is thus a provisional certificate of the right to share in interest, dividends, etc.—The term was a name for U. S. fractional currency during the civil war.

SCRIPT, n. *skrĭpt* [L. *scriptum,* a writing]: type in the form of running letters in imitation of handwriting. SCRIPTORY, a. *skrĭp'tėr-ĭ,* written; not oral.

SCRIPTORIUM, n. *skrĭp-tōr'ĭ-ŭm* [L.—from *scriptor,* a writer—from *scriptus,* pp. of *scribo,* I write]: room in a monastery or abbey set apart for the writing or copying of manuscripts.

SCRIPTURE, n. *skrĭp'tūr* or *-chûr* [L. *scriptūrā,* a writing—from *scribĕrĕ,* to write]: the sacred writings of the Bible; the Old and New Testaments; the Bible—used

chiefly in the plural (see BIBLE, THE: ETC.): in *OE.*, an inscription; manuscript; book. SCRIP'TURAL, a. *-ăl*, contained in the Scriptures, or authorized by them. SCRIP'TURALLY, ad. *-lĭ*. SCRIP'TURALIST, n. *-ĭst*, or SCRIP'TURIST, n. one versed in the sacred writings or Scriptures. ANTISCRIPTURAL, a. opposed to the teachings of Scripture.

SCRIVENER, n. *skrĭv'nėr* [OF. *escrivain;* F. *écrivain;* It. *scrivano*, a notary—from mid. L. *scribanus*, a notary—from L. *scriba*, a scribe; *scribĕrĕ*, to write]: *formerly*, a professional writer; a money-lender; one whose business is to place money at interest.

SCRIVENER, *skrĭv'nėr*, FREDERICK HENRY AMBROSE, LL.D., D.C.L.: born Bermondsey, Surrey, England, 1813, Sept. 29; d. Hendon, 1891, Oct. 26. He graduated from Trinity College, Cambridge, 1835; was appointed assistant at King's School, Sherborne, 1835; three years later was curate of Sandford Orcas, in Somerset; head master at Falmouth School ten years from 1846; incumbent of Penwerris, Falmouth, 1846-61; in the latter year became rector of Gerrans, and held the position till 1875, when he became prebendary of Exeter, and was given the vicarage of Hendon. He made a close study of biblical criticism, and was awarded 1872 a pension of £100 for his services in this direction. He was a member of the company which revised the authorized version of the New Testament. Among his published works are the *Greek Testament*, of which 8 editions were issued; *Codex Bezæ* (1864); *Cambridge Paragraph Bible of the Authorized English Version* (1873); and a *Greek Testament, with Changes Made in the Common Text by the New Testament Company of Revisers* (1881).

SCRIVE'NER'S PAL'SY, or WRITER'S CRAMP: spasmodic affection of the muscles of the finger and thumb of the right hand, sometimes of the forearm. It may be caused by excessive use, or by holding the pen in a position which cramps the fingers. It comes on gradually; but if the work is continued, the trouble increases till it becomes impossible to hold the pen. Efforts to write with the other hand from the one ordinarily used often transfer the trouble to the muscles then called specially into use. The use of pen-holders in which there is no metal, or which are made in peculiar forms, has often been tried, but in most cases with little benefit. Rest, massage, and strengthening the nervous system are the best means of relief. The use of the galvanic battery has, in some cases, contributed to recovery. Artists, musicians, compositors, tailors, and people engaged in other occupations requiring excessive use of certain muscles, are subject to this disease, though it then receives a name connected with the special line of work in which the patient is engaged. The muscles affected by Scrivener's Palsy can be used in other ordinary kinds of work without inducing the peculiar spasmodic contractions.

SCROFULA, n. *skrŏf'ū-lă* [L. *scrofŭlæ,* scrofula—from *scrōfa,* a breeding sow, from the supposition that swine were subject to a similar complaint: F. *scrofules*]: a term formerly applied to a supposed constitutional tendency to certain diseases, including pulmonary phthisis; king's evil; now employed usually to designate tuberculosis of the lymph glands, of the bones, and of the joints with the formation of cold abscesses. SCROFULO'SIS, n. *-lō'sĭs,* scrofula without tubercle; as opposed to tuberculosis. SCROF'ULOUS, a. *-lŭs,* diseased or affected with scrofula, or pertaining to it. SCROF'ULOUSLY, ad. *-lĭ.*—*Scrofula,* even now, is still a term of rather indefinite signification, meaning not so much the determination of the tuberculous process to the lymphatic glands and joints as the fact that the process is essentially sluggish, associated with a disinclination of the suppurative friable abscesses, fistulas, and ulcers to heal, and often leading to cheesy formations in the lymph glands and epiphyses of the bones.

While *scrofula* was the popular name, *struma* [supposed from *struo,* I heap up], used by Celsus, Pliny, and other Latin writers, was the classical name for the disease. The vulgar English name, *The King's Evil,* arose from the long-cherished belief that scrofulous tumors and abscesses could be cured by the royal touch. Multitudes of patients were submitted to this treatment, and, as the old historians assert, with perfect success, from the time of Edward the Confessor to the reign of Queen Anne. The writer of the article 'Scrofula' in *The English Cyclopædia* mentions the curious historical fact that the old Jacobites considered that this power did not descend to Mary, William, or Anne, as they did not possess a full hereditary title, or, in other words, did not reign by divine right. The kings of the House of Brunswick have, we believe, never put this power to the proof; and the office for the ceremony which appears in the English Liturgy as late as 1719 has been silently omitted. The exiled princes of the House of Stuart were supposed to have inherited this virtue. Carte, in the note to Vol. I. of his *History of England,* mentions the case of one Christopher Lowel, who, 1716, went to Avignon, where the court was then held, and received a temporary cure; and when Prince Charles Edward was at Holyrood House in 1745 he, though only claiming to be Prince of Wales and regent, touched a female child for the king's evil, who in 21 days is said to have been perfectly cured. The practice was introduced by Henry VII. of presenting the patient with a small coin (gold or silver). The accompanying is an engraving of the identical touch-piece presented to Dr. Johnson (Lent 1712—when he was only 30 months old), who was one of the persons touched by Queene Anne.—The French kings also touched for the 'Evil,' the practice being traced back to Clovis, A. D. 481. On Easter Sunday, 1686, Louis XIV. is said to have touched 1,600 per-

sons, using the words: *Le roy te touche, Dieu te guerisse* (The king touches thee, may God cure thee). See Chambers's *Book of Days,* i. 82. The literature of this curious

subject is extensive: see Tooker's *Charisma, sive Donum Sanctionis,* etc., 1597; Browne's *Charisma Basilicon, or the Royal Gift of Healing Strumæs,* etc., 1684; and Beckett's *Free and Impartial Inquiry into the Antiquity and Efficacy of Touching for the King's Evil,* 1722. The subject is also examined by Bp. Douglas in *Criterion, or Miracles Examined,* 1754; by Colquhoun in *Isis Revelata,* 1836 (who attributes the cure to animal magetism); and by Howitt in *History of the Supernatural in All Ages and Nations,* 1863.

Scrofula is a disease of early life, and when it does not exhibit any of its manifestations before the period of maturity it seldom shows itself afterward, the tuberculous process being then more commonly located in the lungs, constituting consumption or pulmonary phthisis.

In all systematic descriptions of this disease, two varieties of the scrofulous habit or diathesis are given: the *sanguine* or *serous,* and the *phlegmatic* or *melancholic.* In the *sanguine* there is a general lack of muscular development, the limbs being soft and flabby; the skin is fair and thin; the features are delicate, the rosy hue of the cheeks contrasting strongly with the surrounding paleness; the eyes are gray or blue, and the eyelashes long and silken; the hair fine and light-colored or reddish; and the ends of the fingers broad and expanded, with convex nails bent over them; the intellect is lively and precocious, and there is often considerable beauty. In the *phlegmatic* variety the skin is pale or ruddy, dark, and often harsh; the general appearance dull and heavy; the hair dark and coarse; and the mind usually slow and torpid.

Children in whom the scrofulous constitution is strongly marked often present that narrow and projecting form of the chest called 'pigeon-breasted;' moreover, the abdomen is enlarged, the limbs wasted, and the circulation languid, in consequence of which they are especially liable to chilblains. The digestive organs are so commonly affected—as is evidenced by irregular action of the bowels, fetid breath and evacuations, furred tongue, capricious appetite, etc.—that, in the opinion of an eminent writer, 'strumous dyspepsia presents a more characteristic fea-

ture of this habit of body than any physiognomical portrait that has been drawn of it.' In the great majority of cases the scrofulous disposition is hereditary; indeed, there is no disease so often transmitted from parent to offspring. There is, however, scarcely any doubt that it may be acquired under the action of various unfavorable exciting causes, which may be ranked together as 'causes of debility.' Among them may be especially noticed: (1) Insufficient and improper food; (2) impure air; (3) insufficient exposure to direct sunlight; (4) exposure to wet and cold, and to sudden changes of temperature, especially if the clothing be insufficient; (5) excessive and continued fatigue, whether bodily or mental; (6) intense and prolonged anxiety or mental depression.

We present first the general principles of treatment to be adopted; and then a brief notice of some most frequent forms of the disease.

The diet should be nutritious and sufficiently abundant, and animal food should be given at least twice daily. Dishes containing eggs and milk may usually be taken with advantage. If the patient is not very strong, a little bitter ale at an early dinner will often promote digestion; if, however, it causes flushing or much sleepiness, it must be discontinued. A mother with scrofula should always provide a healthy wet-nurse for her child, as suckling in such a case is injurious to parent and offspring. Constant residence, day and night, in pure and dry air—the open air—should be enforced as far as possible. Residence is desirable where the atmospheric changes are not frequent and sudden, and the winter is comparatively mild. Free exercise of the muscles and lungs in the open air should be insisted on in fine weather; and if this cannot be taken, the best substitute is friction over the surface of the body with the flesh brush. Patients who can bear cold sea-bathing during the summer and autumn months will derive great advantage from it; but if a short immersion is not rapidly followed by a genial glow after drying the skin, such bathing is injurious, in which case warm salt-baths will be found useful. In the case of children the mind should be cheerfully occupied, but not overtasked. The medicines most esteemed in the treatment of scrofula are iodine and its compounds, the salts of iron, bark, sarsaparilla, the alkalies and mineral acids, and cod-liver oil. Iodine and iron may often be advantageously prescribed together, in the form of syrup of the iodide of iron, or other preparations; and cod-liver oil, to be of benefit, must be taken for a long time, and regarded as diet rather than medicine. A tablespoonful may be considered a full dose for an adult; but this quantity should be gradually arrived at, the dose commencing with a teaspoonful. It is most easily taken when floating on a mixture of orange wine, or some other pleasant

bitter fluid, with water. If what are commonly known as 'bilious symptoms' supervene, the use of the oil should be suspended for two days, and some gentle aperients should be prescribed.

In the glandular form, the gland or glands may first become enlarged, either from an attack of acute inflammation, or from an indolent and painless deposit of tubercle. They may remain in this state either stationary or slowly enlarging for years, till from some accidental local irritation, or from some constitutional disturbance, they inflame and suppurate. After the discharge of the matter, the ulcerated skin usually heals with an ugly puckered cicatrix, generally a disfiguring mark through life. The local treatment consists in attempting to disperse the tumor, if it is hard and painless, by painting it with tincture of iodine, or by application of iodine ointment. If it is soft, and likely to suppurate, the process may be facilitated by the application of warm water dressing or emollient poultices. When there is undoubted fluctuation, indicating the presence of pus or matter, it is usually regarded as the best practice to open the abscess. Sometimes the enlarged glands are removed before suppuration occurs. The necessary internal treatment is that above described. The *skin*, especially behind the ears, about the mouth, nostrils, and eyelids, and on the scalp, is liable to pustular diseases in scrofulous subjects. The free use of soap and water, followed by application of black wash or zinc ointment, and proper constitutional treatment, will generally effect a cure, except in the form of scrofulous diseases of the skin of the face known as *Lupus* (q.v.). Among other well known and very serious scrofulous affections is *mesenteric tuberculosis*. There is a peculiar and very intractable form of ulceration known as the *scrofulous ulcer*.

Scrofulous or Tuberculous Diseases among Animals.—They are common among cattle, sheep, and pigs: in early life the tubercle is laid down in the mesenteric glands, and occasionally about the joints: in some regions scrofulous swellings occur also about the head and neck: in some grazing districts, the mucous membrane of the bowels is affected, constituting dysentery: but, as in man, the lungs are in animals also the most common site of tubercle, which here gives rise to pulmonary consumption. Scrofula is induced and fostered by 'breeding in and in.' It may be developed, and is always aggravated, by debilitating influences, such as bad food, or exposure to wet or cold. Prevention is insured by breeding only from healthy vigorous parents, and allowing the stock at all times adequate food and shelter.

SCROGGS, Sir WILLIAM: English jurist: b. Deddington, Oxfordshire, about 1623; d. London, England, 1683, Oct. 20. His name is a synonym for judicial injustice and cruelty. He was appointed chief justice in 1678 in

which office his brutal methods and infamous partiality in conducting the trial of the victims of the 'popish plot' soon made him notorious. He was impeached by the House of Commons in 1680 and in 1681 was removed from his office by the king, who granted him a pension.

SCROLL, n. *skrōl* [OF. *escroue*, a scroll: mid. L. *escroa*, a scroll: Icel. *skra*, a short writing]: a roll of paper or parchment; a roll containing some writing: in *arch.*, an ornament common in all styles; consisting of a band arranged in convolutions, like the end of a piece of paper rolled up. The Greeks used it in their Ionic and Corinthian Styles (q.v.); the Romans in their Composite; and in mediæval architecture, and all styles which closely copy nature, it is of constant occurrence: in *writing*, a circular flourish of the pen attached to a signature. SCROLLED, a. *skrōld*, formed like a scroll.

SCROPHULARIACEÆ, *skrŏf-ū-lā-rĭ-ā'sē-ē*, or SCROPHULARINEÆ, *skrŏf-ū-lā-rĭn'ē-ē:* natural order of exogenous plants, chiefly herbaceous and half-shrubby. The calyx is inferior, persistent, divided into five (sometimes four) unequal divisions. The corolla is monopetalous, more or less irregular, often two-lipped, exhibiting great variety of form; in the bud it has five (sometimes four) segments. The stamens are usually four, two long and two short, sometimes two, rarely five. The ovary is two-celled, with many ovules; the style simple, the stigma generally two-lobed. The lobes of the stigma sometimes display much irritability. The fruit is capsule, or rarely a berry.—This order is very large, containing almost 2,000 known species, distributed over the whole world, both in cold and warm climates. Acridity and bitterness are prevalent characteristics, and many species are poisonous. Some are root parasites. Some are admired and cultivated for their flowers; some are used medicinally. *Digitalis* or Foxglove, *Calceolaria, Gerardia, Castilleia* or Painted Cup, *Pedicularis* or Lousewort, *Mimulus*, Mullein, *Antirrhinum* or Snapdragon, *Gratiola, Scrophularia* or Figwort, *Veronica* or Speedwell, and *Euphrasia* or Eyebright, are familiar examples. Very different from these humble herbaceous plants is *Paulownia imperialis*, Japanese tree, 30 to 40 ft. high, with trunk 2 or 3 ft. in diameter, and flowers in panicles, about as large as those of the Common Foxglove.

SCROTUM, n. *skrō'tŭm* [L. *scrotum*, the scrotum]: the sac or bag that contains the testicles. SCROTAL, a. *skrō'tăl*, pertaining to the scrotum. SCRO'TIFORM, a. *-tĭ-fawrm* [L. *forma*, shape]: in *bot.*, formed like a double bag. SCRO'TOCELE, n. *-tō-sēl* [Gr. *kēlē*, a tumor]: hernia or rupture in the scrotum.

SCROUGE, v. *skrowj*, or SCROOGE, v. *skrôj* [etym. doubtful: comp. Dan. *skrugge*, to stoop]: *colloq.*, to crowd; to squeeze; to press.

SCROYLE, n. *skroyl* [OF. *escrouelles*—from L. *scrof-*

ŭlæ, a scrofulous swelling (see SCROFULA)]: in *OE.*, a loafing idle fellow; a mean rascal.

SCRUB, n. *skrŭb* [Sw. *skrubba;* Dan. *skrubbe;* Low Ger. *schrubben*, to rub, to scrub: Dut. *schrobben*, to rub or scrape; *schrabben*, to scratch: Gael. *sgrìob*, to rub, to scrape]: one that labors hard and lives meanly; a sorry fellow; anything small and mean, a well-worn brush or broom; dense underwood, stunted bushes; in *Scot.*, the jack-plane, or plane first used in smoothing wood: V. to rub hard with a coarse stiff brush. SCRUB'BING, imp. SCRUBBED, pp. *skrŭbd:* ADJ. *skrŭb'ĕd*, in *OE.*, dwarfed or stunted. SCRUBBY, a. *skrŭb'bĭ*, small and mean; stunted in growth; vile. SCRUBBING-BRUSH, a brush for scrubbing, having short and coarse bristles.

SCRUFF, n. *skrŭf*. See SCUFF.

SCRUMPTIOUS, a. *skrŭmp'shŭs* or *skrŭm'shŭs* [etym. doubtful]: *slang*, delightful; first-class; capital; nice; fastidious; particular.

SCRUNCH, v. *skrŭnch:* to crush with the teeth; to crunch; to grind down; to make a crunching noise.

SCRUPLE, n. *skrô'pl* [F. *scrupule*—from *L. scrup'ŭlus*, a small sharp, or pointed stone, anxiety, scruple: It. *scrupolo*]: a trifling cause of uneasiness; doubt; hesitation to decide or act, arising from the difficulty of settling in the mind as to what is right or expedient; a small weight, equal to 20 grains; any small quantity: V. to hesitate to act or decide; to doubt. SCRU'PLING, imp. SCRU'PLED, pp. *-pld.* SCRU'PLER, n. *-plĕr*, one who scruples. SCRU'PULOUS, a. *-pū-lŭs*, nicely doubtful; exact; careful; conscientious. SCRU'PULOUSLY, ad. *-lĭ.* SCRU'PULOS'ITY, n. *-lŏs'ĭ-tĭ*, minute and nice doubtfulness, arising from the fear of doing wrong; over-nicety. SCRU'PULOUSNESS, n. *-lŭs-nĕs*, the state or quality of being scrupulous; niceness or caution in determining or acting, from a regard to truth or propriety.—SYN. of 'scrupulous': nice; doubtful; captious; careful; vigilant; cautious; conscientious; hesitating.

SCRUPLE, *skrô'pl:* lowest denomination of weight among the anc. Romans, and with them denoted the 24th part of an ounce (*uncia*), or the 288th of a pound (*libra*). As a measure of surface it was also the 24th part of the *uncia*, and the 288th of an acre (*jugerum*); seeming, in fact, to be the 24th of the 12th part of any unit. In later Roman times it became the name of the 60th part of an hour, and corresponded to our 'minute.' The 'minute' being the *scrupulum*, the 60th part of a minute was called a *scrupulum secundum* (whence our word 'second'), the 60th part of this a *scrupulum tertium*, and so on. Lexicographers define 'scrupulum' to be a small pebble, such as would be likely to find its way between the sandal and the foot, whence the use of the term to signify a small difficulty or objection.—The term at the present time is a denomination in that modifica-

tion of Troy weight which is used by apothecaries; it contains 20 Troy grains, is the third part of a drachm, the 24th of an ounce, and the 288th of a Troy pound.

SCRUTATOR, n. *skrô-tā'tėr* [L. *scrutātor,* an examiner—from *scrūtor,* I search carefully—*lit.,* among rubbish—from *scrūta,* old trash]: a searcher; an examiner.

SCRUTIN DE LISTE, *skrü-tăng' dėh lēst,* and SCRUTIN' D'ARRONDISSEMENT, *dăr-rŏng-dĕs-mŏng'* [Fr.]: methods of balloting in France for deputies to the national assembly. In the *scrutin de liste* each elector votes for as many candidates as there are deputies to be elected from his *département.* In the *scrutin d'arrondissement* each elector votes for the one deputy (or representative) apportioned to his *arrondissement; département* and *arrondissement* being terms in many respects analogous to our 'state' and our 'congress district' respectively.

SCRUTINY, n. *skrô'tĭ-nĭ* [F. *scrutin,* a ballot—from L. *scrutin'ĭum,* a search—from *scrutārī,* to search carefully—from *scrūta,* old trash: It. *scrutinio*]: close search or inquiry; careful investigation; an examination of votes given at an election. SCRU'TINEER, n. *-nēr,* one appointed to examine into the votes given at an election. SCRU'TINIZE, v. *-nīz,* to examine or search into closely or critically. SCRU'TINIZING, imp.: ADJ. closely searching. SCRU'TINIZED, pp. *-nīzd.* SCRU'TINIZER, n. *-nī-zėr,* one who examines with critical care.

SCRUTOIRE, n. *skrô-twŏr'* [OF. *escritoire*]: a case of drawers, or a cabinet with a folding-down lid, convenient for writing on—usually ESCRITOIRE, which see.

SCRUZE, v. *skrôz:* in *OE.,* to press or thrust hard; to squeeze out of; to compress. SCRUZ'ING, imp. SCRUZED, pp. *skrôzd.*

SCUD, v. *skŭd* [Dan. *skyde,* to shoot, to shove: Sw. *skutta,* to leap: Gael. *sgud,* to walk or move rapidly]: among *seamen,* to run directly before the wind in a gale, as a ship, with little or no sail set; to run with precipitation: N. the act of scudding; loose thin clouds driven along swiftly by the wind. SCUD'DING, imp. SCUD'DED, pp. SCUDDING UNDER BARE POLES, the state of a ship when driven before the wind without any sails set. A SCUD OF RAIN, a rapid shower driving with the wind. TO SCUD ALONG, to move on swiftly. SCUDDLE, v. *skŭd'l,* to run with an affectation of haste or precipitation.

SCUDDER, *skŭd'ėr,* HENRY MARTYN, D.D.: missionary: b. Panditeripo, Ceylon, 1822, Feb. 5; d. Winchester, Mass., 1895, June 4; son of John S., missionary physician. He graduated at New York University 1840, and Union Theological Seminary 1843. Proceeding to India as missionary of the American Board, he was in service at Madras, Vellore, and other places; and founded the Arcot Mission; also a dispensary there, having studied

medicine. Returning to America for his health, he was pastor of a Presbyterian Church in San Francisco 1865-71, the Central Congregational Church, Brooklyn, N. Y., 1872-82, and the Plymouth Congregational, Chicago, 1882-87, after which he went as missionary to Japan. He published books in the Sanskrit, Teluga, and Tamil languages—in the last a Liturgy of the Ref. Dutch Church (1862); *The Bazaar Book or the Vernacular Teacher's Companion* (1865); *Sweet Savor of Divine Truth* (1868); and *Spiritual Teaching* (1870).

SCUDDER, Horace Elisha: American author: b. Boston, Mass., 1838, Oct. 16; d. Cambridge, 1902, Jan. 11. He was graduated from Williams College in 1858, engaged as a teacher in New York for three years, and in 1867-70 he edited the *Riverside Magazine for Young People.* He then entered business life, but soon withdrew to devote himself entirely to literature. His juvenile publications, which were widely popular, include: *Seven Little People and their Friends* (1862); *The Bodley Books* (1875-87); *The Book of Legends Told Over Again* (1899); etc. His work was not, however, confined within the limits of juvenile literature. He edited the *Atlantic Monthly* in 1890-8, and contributed much to it, though usually anonymously; edited: *American Commonwealths; American Poems* (1879); *American Prose* (1880); and wrote: *Life and Letters of David Coit Scudder, a Missionary in India* (1864); *Noah Webster, a Biography* (1882); *Men and Letters* (1887); *James Russell Lowell, a Biography* (1901); etc.

SCUDDER, John, M.D.: 1793, Sep. 3—1855, Jan. 13: b. Freehold, N. J.: missionary physician. He graduated at Princeton, and at the New York College of Physicians and Surgeons 1813; and practiced awhile in New York; but in 1819 went to India as missionary of the American Board, was the next year ordained minister in the Ref. Dutch communion (the American Board, though prominently Congregational, not being denominational), and labored in Ceylon. He opened a hospital and rendered much service during the prevalence of yellow fever and cholera—meanwhile establishing churches and schools. Excepting two visits to the United States, and one to the Cape of Good Hope, where he died, he labored at Madras after 1839. His nine children were missionaries in s. India. He published *Letters from the East* (1833); *Appeal to Youth in Behalf of the Heathen* (1846); *Letters to Pious Young Men* (1846); *Provision for Passing over Jordan* (1852), besides tracts and articles. A memoir of him was written by the Rev. John B. Waterbury.

SCUDDER, John Milton: American eclectic physician: b. Harrison, Ohio, 1829, Sep. 8; d. Daytona, Fla., 1894, Feb. 17. He was educated at Miami University, Oxford, Ohio, and was graduated in medicine at the

Eclectic Medical Institute of Cincinnati, Ohio, in 1856. In 1857 he was appointed demonstrator of anatomy and served as professor of obstetrics and diseases of women in his alma mater 1858-60. From 1860 to 1887 he filled the chair of pathology and practice of medicine and from 1887 to his death, the chair of hygiene, principles of medicine, physical and specific diagnosis. In 1869 he published the doctrine of specific medication, originated by him, and since that time the basis of practice of the eclectic school of medicine. For 32 years he was editor of the *Eclectic Medical Journal,* the oldest periodical devoted to American eclectic medicine. He wrote *Practical Treatise on Diseases of Women* (1858); *Eclectic Materia Medica and Therapeutics* (1860); *The Eclectic Practice of Medicine* (1864); *The Use of Inhalations* (1865); *Domestic Medicine* (1866); *The Principles of Medicine* (1867); *Diseases of Children* (1867); *Specific Medication* (1871); *Reproductive Organs and Venereal Diseases* (1874); *Specific Diagnosis* (1874). He was the most conspicuous eclectic physician of his time.

SCUD'DER, SAMUEL HUBBARD, PH.D., LL.D.: b. Boston 1837, Apr. 3: entomologist: bro. of Horace Elisha Scudder. He graduated at Williams College, and the Lawrence Scientific School, where he continued as asst. of Louis Agassiz, 1862-64; and was asst. librarian of Harvard, 1879-85. Since 1886 he has been one of the paleontologists of the U. S. geol. survey. He is recognized as an authority on fossil insects. His great work on the *Butterflies of the Eastern United States and Canada,* issued at $75, is the noble result of long research, though the revival in it of obsolete names is not generally approved. A popular work is *Butterflies, Their Structure, Changes,* etc. (1882). Other publications are *Catalogue of Scientific Serials of all Countries* 1633—1876 (1879); *Nomenclator Zoologicus* (1882); *Systematic Review of our Present Knowledge of Fossil Insects* (1886); *Winnipeg Country,* etc. (1886); *The Fossil Insects of North America* (1890); *The Life of a Butterfly* (1893); *Index to N. A. Orthoptera* (1901); etc.

SCUDERY, *skü-dā-rē',* MADELEINE DE: French novelist of a former day: 1607-1701, June 2; b. Havre. Left an orphan at the age of six, she, with her brother Georges de Scudery (1601-67), was carefully educated by one of her uncles. While still young, she left Normandy for Paris, was admitted to the Hôtel Rambouillet (see RAMBOUILLET), and soon became one of the oracles of the brilliant society that assembled there. It was in this famous but showy circle that Mademoiselle Scudery gathered that immense fund of watery sentimentalism, platonic gallantries, unending 'polished' conversation, dull ceremonial incidents, and commonplace moralizing, which are the contents of her romances. Their popularity was immense: everybody with pretensions to 'taste,' except the Port-royalists, Bossuet, and a few critics of the

stricter sort, professed a boundless admiration for them. The bishops in general—e.g., Camus, Mascaron, Huet, Godeau, Fléchier, Massillon—were delighted with their stately and decorous prolixity. The personages of her novels, though under classical names, can usually be identified with some of her fashionable contemporaries. When the troubles of the Fronde had broken up the gatherings at the Hôtel Rambouillet, Mademoiselle Scudery, under the name Sapho, organized a literary circle of her own, which met every Saturday at her house in the Rue de Beauce. She died at Paris, at the advanced age of 94, honored and respected to the last; for in personal character she was a pattern of the decorous morals and superfine demeanor that she loved to depict. Her style was not devoid of literary merit, and she evidently was a student of character.—Her principal works (never again to be read in this world) are: *Ibrahim, ou l'Illustre Bassa* (Par. 4 vols. 1641); *Artamène, ou le Grand Cyrus* (Par. 10 vols. 1649-53); *Clélie, Histoire Romaine* (Par. 10 vols. 1656); *Almahide, ou l'Esclave Reine* (Par. 8 vols. 1660); 10 vols. of *Conversations Nouvelles, Conversations Morales,* and *Entretiens de Morale* (1680-92). —See Victor Cousin's *La Société Francaise au Dixseptième Siècle.*

SCUDO, n. *skô'dō,* SCUDI, n. plu. *skô'dē* [It. *scudo,* a shield, a crown or dollar—from L. *scūtum,* a shield]: an Italian silver coin corresponding to the Spanish *Piastre* (q.v.), the American Dollar (q.v.), and the English Crown (q.v.); named from its bearing the heraldic shield of the prince by whose authority it was struck. It differed in value in different states of Italy. In Rome the *scudo Romano* or *scudo nuovo* was equal to about $1.03; and was subdivided into 10 *paoli* or 100 *bajocchi.* The Venetian scudo or *scudo della croce,* was of higher value than the Roman; while the old scudi of Bologna, Genoa, and Modena were of less value. Scudi are now rare, being displaced by the new decimal coinage: but the name is sometimes given to the piece of 5 lire, equivalent to a 5 franc piece (= about 96½ c.) in the French coinage. Scudi of gold also were struck in Rome, the *scudo d'oro* being equivalent to 10 *scudi di argento.*

SCUFF, n. *skŭf,* or SCRUFF, n. *skrŭf* [Dut. *schoft,* the nape of the neck: Fris. *skuft,* the withers of a horse, the tuft of hair which a person lays hold of to mount: Goth. *skuft,* hair of the head]: the loose skin on the shoulders by which a dog or cat is laid hold of; nape of the neck.

SCUFFLE, n. *skŭf'fl* [prov. Eng. *scuff,* to shuffle in walking: Sw. *skuffa,* to nudge, to push: O.Dut. *schuffelen,* to drive by kicks and shoves]: a close struggle between two or more persons for the mastery; a confused or hasty contest; a fight: V. to strive or struggle blindly; to fight confusedly. SCUF'FLING, imp. *-flĭng.* SCUF'FLED, pp. *-fld.* SCUF'FLER, n. *-flĕr,* one who scuffles.

SCUFFLE, v. *skŭf'fl* [Dut. *schoffel*, a Dutch hoe or scuffler; *schoffelen*, to scuffle weeds: Scot. *skuff*, to graze]: to rub lightly; to do any kind of work, as hoeing, sweeping, brushing, etc., in a slight but efficient manner: N. an instr. for lightly paring the surface of the ground to kill weeds. SCUF'FLER, n. *-flėr*, one who scuffles; a kind of horse-hoe.

SCULK. See SKULK.

SCULL, n. *skŭl* [Norw. *skol*, a splash, a dash: Icel. *skola*, to wash: more probably connected with Icel. *skál*, a bowl, a hollow, the blade of the *scull* being *hollowed out*]: a cock-boat; in fresh-water usage, an oar so short and so light that a man can work a pair in rowing a skiff or light boat: among sea-faring men, a short oar placed over the stern of a boat, with the blade in the water, and worked somewhat like a screw by one person —the term is now frequently applied with this signification in fresh water also: V. to impel a boat by means of sculls; to propel a boat with a short oar over the stern. SCULL'ING, imp. SCULLED, pp. *skŭld*. SCULL'ER, n. *-ėr'*, one who sculls; a boat rowed with sculls.

SCULL, n. *skŭl* [Dut. *school;* Ir. *sgol*, a scull or shoal of fishes: a variant of SHOAL, which see]: a compact mass or body of fishes moving in one direction; a shoal.

SCULLERY, n. *skŭl'ėr-ĭ* [Icel. *skola;* Sw. *skölja;* Dan. *skylle*, to rinse, to wash: AS. *swilian*, to wash: OE. *squylerey;* Norm. F. *squillerge*, a scullery]: in a *house*, a small room set apart for keeping kitchen utensils and for cleaning them; a place to wash and scour in. SCULLERY-MAID, a female servant who attends to the cleaning of the kitchen utensils, etc.

SCULLION, n. *skŭl'yŭn* [OF. *escouillon;* Sp. *escobillon*, a dish-clout: Sp. *escoba*, a brush, broom—from L. *scōpæ*, a besom]: a servant whose duty it is to keep the kitchen utensils clean; a low mean drudge. *Note.—Scullion* and *scullery* are totally distinct in origin.

SCUL'PINS: the name given to various species of spiny-rayed teleostomous fishes of the family *Cottidæ*, or to the members generally of that family. The sculpins are fishes of striking appearance owing to the peculiar manner in which the body tapers regularly backward from the large, depressed head, and the large size of the fins. The mouth is large, the eyes placed so that they look more or less upward, a bony rod runs across the cheek between the suborbital and the preopercular bones, and the bones of the head are ornamented in varied fashions with numerous ridges and spines. The skin is largely naked but is often provided along the lateral line and elsewhere with bony plates or spines. All of the fins, and especially the pectorals, are of large size and the latter has a remarkably extended base of attachment. The family is a large one, embracing more than 60 genera and 250 species.

THE WINGED VICTORY.

SCULPTURE, n. *skŭlp'chur* [F. *sculpture*—from L. *sculptūra*, a cutting out or carving—from *sculpĕrĕ*, to carve in stone]: art of cutting or carving stone to form representations of visible or ideal objects, e.g., the figure of a man; any work of art produced by the chisel, or from hard or solid material: V. to cut or carve with the chisel, as stone. SCULP'TURING, imp. SCULP'TURED, pp. *-churd:* ADJ. produced in stone by the chisel. SCULP'TURAL, a. *-ăl*, pert. to sculpture. SCULPTOR, n. *-tėr*, one whose occupation or profession is sculpture. SCULP'TRESS, n. *-trĕs*, a female who practices the art of sculpture. SCULP'TURESQUE', a. *-ĕsk'*, possessing the character of sculpture; denoting high relief.—*Sculpture*, as artistic carving, is the art of expressing ideas or images in solid materials. In this sense processes which do not, strictly speaking, involve the cutting of hard substances are included: thus S., as an art, includes the molding of soft materials also. Clay, and even wax, have been in all ages of the art employed, sometimes for the purpose of sketches or models for reproduction in marble or metal, sometimes as the material of the finished work. The art of S. is as old as any that has been handed down to us, antidating the earliest written records. The great nations of antiquity all practiced it, though only Mesopotamia and Egypt have left anything like a fair representation of the state of the art in very early times. From the nature of this craft its productions have proved more durable than those of painting, and have come down to us in more numerous instances even than works of architecture. While the latter have been destroyed, works of S. have remained buried, and, discovered later, have been from time to time reproduced for the instruction and enjoyment of modern nations.

Sculptures are distinguished by different terms, according to the nature and completeness of the work. Groups or figures completely represented are said to be 'in the round.' Those only partially detached from the mass or background are said to be 'in relief': this is called 'high' or 'low relief,' according as the figure stands fully or slightly above the mass behind it. The ancient Egyptians employed another kind of relief, their figures being sunk below the surface, and only the prominent portions remaining level with it. In this case the background or unoccupied space is not cut away, but the figures are worked downward into it. Another process is called 'intaglio,' the whole figure being regularly designed and molded, but 'cut into' the material and reversed, as in a mold for casting: this is usually applied to the making of gems and seals. (See RELIEF: INTAGLIO: ALTO-RILIEVO.) Another sculptural process is used in the treatment of metals. As metals are both harder than stone and more valuable, it is not possible to cut or grave works out of masses of metal as in stones or gems. The metal is fused by heat, and the form is given it while in that state. This is done by first forming or molding the design in clay or

other soft material. Around the model thus formed—or a plaster cast made from it—a mold is formed of sand, which is prepared and pressed round it in a damp state till it takes the complete form of the model, which is then removed, and the liquefied metal poured in. It takes the exact shape of the model by this means, its thickness being determined by the size of a sand 'core' suspended within the mold. Such work is said to be 'cast,' because of the casting of the liquid metal into the mold. Other processes, however, have, in the finer works, to be applied. Roughnesses and inaccuracies are removed by means of the chisel and graving-tool; the entire surface being sometimes elaborated or 'engraved' with an ornamental design.

Sometimes the whole design is engraved without any previous casting. In this case the metal has had its form given by 'hammering' or 'beating.' The metal, hot in the case of iron or bronze, or cold in the case of silver and gold—softer metals—is beaten on the anvil into its form. A coarser and deeper method of engraving is called 'chasing,' where deeper sinkings and bolder prominence are given to various parts of the design.

As to materials in use for these purposes: in sculpturing, or cutting designs or figures, we generally find that marbles have been employed; the most famous having been the 'Parian,' from the Isle of Paros, and the Pentelic, from the mountain of that name in Attica. Besides these, the ancients used various other marbles—white, and latterly colored: the late classical sculptures sometimes employing both white and black: or colored, combined on the same work, the colored marble being used for the dress or hair as it might be. The Egyptians, besides the use of these materials, and various kinds of fine and coarse-grained stone, employed porphyry, purple and black, an exceedingly hard and difficult material to handle. Modern sculptors have largely employed the white marble of Carrara and Serravezza in Italy. 'Terra Cotta,' or burnt clay, has been extensively used in ancient and in modern times; the clay being molded to the utmost delicacy while soft, and then baked. Singularly fine reliefs and statuettes in this material remain from the Etruscans and Greeks, as well as from Egypt and elsewhere, as may be seen in the Brit. Museum and other great collections. The Egyptians modelled little figures in porcelain clay, and colored and enamelled them after the fashion of porcelain, and great numbers of such are in most of the museums. The word 'toreutic,' from the Greek *toreuō*, to pierce or bore, is usually applied to S. in metal. For this the metal most appropriate, and most generally used in ancient and modern times, is 'bronze,' a mixture of copper and tin, known also as 'brass.' Other metals, in small quantities, were introduced, and various kinds of bronze have resulted from this variety, as well as from the proportions of the two principal metals, the method of fusion, etc. Ægina, Delos, and Corinth made different kinds of bronze, each of excellent quality. Besides this

favorite metal, gold, silver, copper, and even lead, and mixtures of lead and tin—'pewter'—have been used for artistic S. In the celebrated period of Greek S., gold and ivory were used together. These statues, two of which were made by Phidias, were called 'chryselephantine'—i.e., of gold and ivory.

The ordinary modes of proceeding in S. have been very various. Whether the more celebrated sculptors of ancient times cut out their designs at once without the previous rehearsal of a model, we do not know; it is, however, very probable. The Egyptian bas-reliefs are still seen in some of their tombs, lined out, and corrected afterward by a master's hand previous to execution. Michael Angelo, most powerful of modern sculptors, is said to have hewn out some of his statues without the use of any model. Florence, and the Louvre (Paris), contain marble sketches or unfinished figures showing the boldness with which he attacked the stone. As, however, there can be no putting on of any of the substance of stone once reduced by inadvertence, the artist commonly makes his sketch or design, in small, in clay. This is subsequently enlarged and then studied from 'the life;' that is, men, horses, draperies, etc., the most suitable to the artist's present purpose, are selected, and with these before him, he corrects his design and perfects it while the material is soft. A plaster mold is then taken in which, in turn, a plaster cast is made, and with this cast before him, the artist begins work on his marble. Measurements are taken by means of the 'pointing instrument' which rests upon three points of the cast and may be transferred to three similar points on the stone. A sliding needle on a movable arm is adjusted on the cast to some spot to be located in the block—say the extremity of a nose—and all joints are made fast with thumb screws. The entire instrument is now removed to the stone and the needle indicates what depth must be bored to locate the point. The drill completes the work and the instrument is returned to the model to take another 'point.' In this way the distance of the various surfaces of the future figure from the outside of the unshaped marble are ascertained, and the workmen rough out the figure down to those measurements. The sculptor then gives the delicate touches that finish it. We notice one other question relative to S. before proceeding to a short review of the art historically—the question of color. The ancients—i.e., Egyptians, Assyrians and others—did color their statues, intending, probably, to do so up to 'life'—i.e., to a direct imitation. The Greeks, too, employed color on their statues, as well as on their architecture. To what extent they colored their sculpture, it is not easy to determine. Partly, indeed, time has so altered, and partly so obliterated the coloring material, that we can form only an approximate judgment. It seems probable that the coloring was conventional—that is, that color was used to add to the splendor and distant effect of the work, rather than to attempt

positive imitation of real life. A head in the Elgin Room of the Brit. Museum has been colored, the hair full red. The eyes are completely cut out, so as to show dark and shadowy hollows, even with the face colored. Gilding, too, was used for the hair. Color was extensively used in the middle ages. Many, if not most, interior sculptures were colored during that period. Several modern sculptors have experimented with color, notably Gibson, the Englishman whose 'tinted Venus' attracted much attention 60 years ago. Other means, however, were used to give color in late classic times, as is seen in the Vatican, where a bust retains both enamelled eyes and black eyelashes inserted into the marble. To the mixture of marbles to obtain the effect of color we have already alluded.

For notices of the best sculptural work known, that of the time of Phidias, see ELGIN MARBLES.

We proceed to a summary survey of the history of S. Of the art of the earliest times the Egyptian and Babylonian remains are best known. Both of these countries offer perfected works dating from at least 3,800 B.C. and demonstrating that sculpture must have been practised long before this. Both were restricted by religious traditions from arriving at a full representation of the human form; both in later times used mixed forms of man-headed bulls, or man-headed and ram-headed lions. Usually these were colossal. The Egyptians, besides this, covered the walls of their sepulchres and temples with spirited and amply detailed historical representations. The ancient Hittites had a crude sculpture of their own; the art of the Phœnicians was more advanced, while on the island of Cyprus we find abundant material showing a high development of sculpture in which many influences from various lands are appreciable. That somewhat mysterious nation, the Etruscans, has left its record also in many parts of Italy, revealing much skill in the handling of bronze as well as terra-cotta. Judged by later standards all these schools, including the Etruscan, are stiff and dry in execution—that is, lacking the ease, fulness, and movement of the human form. They are called 'archaic,' meaning by that term unformed and undeveloped, belonging to an age uninstructed in technical knowledge.

It is to Greece that we must turn for the highest development of this venerable art. From about B.C. 600 a rapid progress is perceptible; schools were formed in the great cities of Greece, Sicyon, Ægina, and Corinth; and we read of Callon, Onatas, Glaucias, and many other names, culminating in Ageladas of Argos. These men sculptured on a colossal scale, and we have already alluded to the bronze for which the Greek cities had long been famous. These schools produced the famous Æginetan Sculptures (q.v) found 1812, and now at Munich, as well as those of Selinus, in Sicily.

The great period of S. began at B.C. 500, when Phidias was born. Ageladas his master, was also the instructor of

Polyclitus and Myron, of whose works copies are in the Vatican and elsewhere, made by Greek artists in the time of the Roman empire.

The great work of Phidias (q.v.) is described elsewhere. Pericles did much to encourage the arts both of sculpture and painting. Phidias and his sturdy colleagues were succeeded by the genial Praxiteles (q.v.) who with his disciples produced works of a grace never equalled before or since. He carried the representation of the human form further than Phidias and his scholars, and draperies in his hands lost their severe character, and clung to the rounded limbs, which they no longer concealed. His work is seen in the famous Hermes at Olympia, and in many reproductions by late copyists. Praxiteles is said to have been the first to represent the female form quite nude, and to have contributed by such sculptures to the enervation and gradual sensualizing of the art. His most celebrated contemporary was Scopas, of whom we know practically nothing. The great name in the time of Alexander was Lysippus of Sicyon. With the breaking up of the world-empire comes what is known as the Hellenistic age of art, a period of some 200 years when Greek art flourished most luxuriantly on foreign soil. The extraordinary reliefs of the great altar of Pergamon are from this time, as are also the Venus of Milos, the Niké of Samothrace and the Laocoön group.

The Roman conquest of Corinth under Mummius in the 2d c., and afterward of Athens, brought this old art to an end in its own land. Thenceforth Greek artists were found all over the Roman empire, and the famous works of the earlier sculptors were reproduced by them for their new masters. The Roman S., indeed, is included in this phase of Greek art—the last remarkable work that we here notice of classic times being the famous column of Trajan, in the early part of the 2d c. after Christ: this is, in fact, a tower more than 100 ft. high, of white marble, entirely covered with bas-reliefs representing the Dacian wars of Trajan. We here see the expiring effort of classic art. Skilful and correct as in the design, it is, as a whole, graceless, stiff, and without beauty, compared with the old work. Constantine in the 4th c. carried off to Byzantium, his new seat of government, all the S. that he could remove.

The art revived in Italy, where indeed it had never quite died out. All through the Romanesque period bronze casting and the carving of conventional sculpture was practiced, in some places with considerable skill. But the spirit of development was breathed into the sleeping art by Niccolo Pisano, an architect, who in 1260 completed his great pulpit in the Baptistry of Pisa. His son Giovanni and his pupil Andrea carried on the work in other cities, where notable things were done, as at Orvieto, Siena, Perugia, and Pistoja. Andrea Pisano made one of the bronze gates of the Baptistry of Florence. Ghiberti, author of the more famous doors of the same Baptis-

try, a hundred years later, excelled in a picturesque form of relief, while his contemporary Jacopo della Quercia was a distinct forerunner of Michael Angelo in his feeling for sculptural massiveness. Donato di Betto Bardi, or Donatello, the most celebrated sculptor of the early Renaissance was born in 1386, and Luca della Robbia, a modeler of exquisite enameled terra-cottas, and founder of a line of famous artists, was born in 1500. With these men disappeared all of the crudities of the earlier efforts. The Renaissance was now in full flower and the productions of even the 'little masters' of the second half of the 15th c.—Desiderio da Settignano, Mino da Fiesole, the Rossellini and Benedetto da Majano—share the vigor, dignity and child-like freshness which was the common heritage of the time. These men were all marble-cutters of incredible skill; of the same period were two remarkable workers in metal: Antonio Pollajuolo and Andrea del Verrochio.

At the end of the 15th c. appears Michael Angelo, one of the greatest artists of all time. His tempestuous life and his sublime achievements are familiar to all. In him we have the culmination of the Renaissance. He had no successor in sculpture although Cellini and Giovanni da Bologna shared his skill without his inspiration. After his death Italian sculpture fell into complete decadence. In the 17th c. the brilliant Bernini dazzled and dominated all Europe for a time with his theatrical art. A reaction took place in the latter half of the 18th c. when Antonio Canova made fashionable a style of so-called 'classic simplicity and repose' which was adopted and admirably perfected by the Danish sculptor Thorwaldsen, long resident in Rome. Although affected and often far removed from the essential dignity of classic art, this new style was somewhat of an improvement, leading to better things in other lands if not in Italy where romanticism and realism have borne strange harvests. Italy is full of clever modelers and carvers but there is no master among them to-day.

For many centuries France has been famed for her sculptors; even before the first gleams of the dawning Renaissance in Italy the carvers of central and northern France had developed a notable and consistent school. Unaided by classic inspiration the designers of the Cathedrals of Normandy, Picardy, Berry and of the Paris basin evolved in the 12th and 13th c. a truly national art. Not even the Greeks were more successful in harmoniously uniting architecture and sculpture. Many of the decorative statues of this period seem crude when separated from their original surroundings, but in the lofty niches which they were intended to adorn, they reveal not only strength but an exquisite adaptation to their purpose. As a rule the names of their authors were never recorded. The works created by Claux Sluter and other Flemings for the dukes of Burgundy, mark the close of the 14th c. and the beginning of the 15th as a period of peculiar interest.

These sculptors show great strength of conception and an increasing expression of individuality. The influence of the Italian Renaissance is first noticeable in the so-called School of Tours where we find an amalgam of French and Italian motifs and methods in varying proportions. The most eminent name of this period is Michel Colombe. The leaders of the perfected French Renaissance—in the latter half of the 16th c.—were Jean Goujon and Germain Pilon. The next century offers the names of Pierre Puget and Coysevox. Amid the hosts of clever French sculptors of the 18th c., Jean Antoine Houdon was undoubtedly the greatest. The early 19th c. was rendered notable by the works of Rude, David d'Angers and Barye, the sculptor of animals. Carpeaux, a pupil of Rude, possessed also a remarkable talent. All of these men rebelled against the pseudo-classicism of Canova, then ascendant throughout Europe. Its dominance in France was finally broken by Paul Dubois who introduced the appreciation of the early Florentine masters. More or less associated with Dubois were Barrias, Chapu, Falguière, Mercié, St. Marceaux and Frémiet, the animal sculptor. Dalou, of a more audacious inspiration, has been surpassed, however, by August Rodin, a man of extraordinary originality who is recognized to-day as the world's greatest living sculptor. Bartholomé has produced one great work.

Sculpture was practiced in Germany from earliest times; the Gothic churches of this country are as elaborately carved as are those of France, although the workmanship does not average as high. In Nuremburg we find the work of three famous sculptors of the 15th c.: Veit Stoss, Adam Kraft and Peter Vischer. In the bronze work of the latter, extending into the 16th c., we find the first evidences of Italian influence. The most prominent name in German sculpture of the 17th c. was Andreas Schlüter. In the late 18th and early 19th c. we find Dannecker, Schadow, and, above all, Rauch (1777–1857) who holds the highest rank among the historical sculptors of Germany. His greatest work is the monument to Frederick the Great in Berlin. Among his pupils and followers were Drake, Bläser, Schievelbein and Kiss. In Dresden we find Rietschel, Hähnel and Schilling. In Munich Schwanthaler created many works of a theatrical nature. Among the living sculptors of Germany Reinhold Begas is probably the best known. A large group of younger men give promise of a still more interesting development of this favorite art of Germany.

The English have long patronized S. but have themselves produced few notable works. It was the French element which designed and decorated the noble cathedrals of England. John Flaxman (1755–1826) was one of the first Englishmen to win distinction in this essentially southern art, and his contribution was largely in the form of designs for low reliefs. Chantrey's monuments resemble those executed by Flaxman. John Gibson (1791–1866) was a pupil of Canova and his work shows much of the

grace and delicacy of his master's. Alfred Stevens (1817–1875) approached grandeur in his Wellington memorial in St. Paul's. Thomas Woolner, Hugh Armstead and Edgar Boehm were prominent in their day, and were succeeded by Hamo Thornycroft, Onslow Ford, and Alfred Gilbert, men of much ability.

Although the history of S. in the United States covers but a short period of time, the development of the art in this country has been remarkable, some of its later achievements ranking with the best of modern productions. A few busts were modeled, a few naval figure-heads carved in wood, in the 18th c., but the encouragement was slight. Horatio Greenough (1805–52) was America's first professional sculptor, and the first to study abroad. His work naturally reflected the Canova influence of his day as did the once popular ideals of Hiram Powers (1805–73). More prolific than either was Thomas Crawford (1813–57) author of various decorations on the National Capitol, and of the Washington monument at Richmond. Other pioneers were Thomas Ball (1819), Henry Kirke Brown (1814–86), Randolph Rogers (1825–92), William Wetmore Story (1819–96) and Harriet Hosmer (1830) Last, and perhaps the most skillful of the American classicists, was William H. Rinehart (1825–74) of Baltimore. Erastus D. Palmer (1817–1904) of Albany and John Rogers (1829–1904) were of more distinctly native inspiration, the former creating works of no little ideal beauty, the latter celebrating patriotism and the homelier virtues in naïve, realistic statuettes. John Q. A. Ward (1830) is the dean of practicing sculptors of America with a record as honorable as it is long, culminating perhaps in his statue of Henry Ward Beecher of Brooklyn. The work of Olin L. Warner (1844–96) is highly appreciated by artists. Augustus Saint Gaudens (1848) made his début in 1880 with the well-known Admiral Farragut of Madison sq., New York, a statue which set a new standard in American monumental sculpture. It was followed by a series of distinguished works including the Abraham Lincoln of Chicago, the Shaw memorial in Boston, the Adams memorial at Washington, and the recent equestrian Sherman in New York City. These are all worthy to be called masterpieces and have given their author a position among the foremost sculptors of the world. Daniel C. French (1850) also ranks high, with many beautiful works to his credit, most prominent of them being his 'Death and the Young Sculptor' and the O'Reilly memorial,—both in Boston—his 'Alma Mater' at Columbia University, the great groups of 'The Continents,' decorating the new Custom House, New York, and several fine equestrian statues made in collaboration with Edward C. Potter (1859). Saint Gaudens' brilliant pupil, Frederick MacMonnies (1863), has won a great name both at home and abroad. He has lived in France for many years and there he modeled his Stranahan, Nathan Hale, Shakespeare, Bacchante, Columbian Fountain and

many other notable works. Equally well known in Paris is Paul Bartlett whose Columbus and Michael Angelo for the Congressional Library are very distinguished conceptions. His equestrian Lafayette stands in a court of the Louvre in Paris. George Gray Barnard is characterized by great originality and vigor. His large groups for the new State House of Pennsylvania are among the most remarkable of modern sculptures. The list might be continued with a score of names of men, middle-aged and young, whose promise and achievements signify much in the advance of sculpture in America.

For details of most of the eminent sculptors mentioned in this article, see their respective titles.

Among many books upon S., of various periods and countries may be mentioned the following: Luebke, W., *History of Sculpture;* Marquand and Frothingham, *History of Sculpture;* Furtwaengler, Adolf, *Masterpieces of Greek Sculpture;* Tarbell, T. B., *A History of Greek Art;* Gardner, Ernest, *Handbook of Greek Sculpture;* Von Mach, Edmund, *Greek Sculpture, Its Spirit and Principles;* Mitchell, Lucy, *History of Ancient Sculpture;* Murray, A. S., *The Sculptures of the Parthenon;* Waldstein, Charles, *Essays on the Art of Pheidias;* Symonds, J. A., *Renaissance in Italy,* vol. III., *The Fine Arts,* ch. 1, 3, 8; Perkins, Charles, *Handbook of Italian Sculpture;* Holroyd, Charles, *Michelangelo Buonarroti;* Lindsay (Lord Balcarres); *Donatello;* Brownell, W. C., *French Art* (chap. 4–7); Taft, Lorado, *American Sculpture.*

SCUM, n. *skŭm* [Icel. *skúm;* Dan. *skum;* Ger. *schaum;* OF. *escume;* It. *schiuma;* Gael. *sgum,* foam, froth]: impurities which rise to the surface of liquids, particularly when boiled or fermented; the refuse; the recrement; the portion which is worthless or vile: V. to clear off scum. SCUM'MING, imp. SCUMMED, pp. *skŭmd.* SCUM'MER, n. *-mėr,* an instr. for taking off the scum of liquids. SCUM'MINGS, n. plu. *-mĭngz,* the matter skimmed from boiling liquids. SCUM'MY, a. *-mĭ,* covered with scum.

SCUMBLE, v. *skŭm'bl* [from SCUM, which see]: to spread or rub colors very thinly over other colors in order to modify the effect. SCUM'BLING, imp. *-blĭng:* N. the act of spreading colors of a semi-transparent character over other colors to modify the effect. SCUM'BLED, pp.

SCUNCHEON, n. *skŭn'shon* [etym. doubtful]: in *arch.,* the stones or arches thrown across the angles of a square tower to support the alternate sides of the octagonal spire; also the cross-pieces of timber across the angles to give strength and firmness to a frame.

SCUP, or SCUP'PANG: see PORGY.

SCUPPER, n. *skŭp'pėr* [OF. *escopir;* Bret. *skopa,* to spit; Sp. *escupir,* to spit, to dart]: holes in a ship's deck or side to carry off rain-water or the water shipped—usually in the plu., SCUPPER-HOLES, or SCUPPERS. SCUPPER-NAIL, a nail with a very broad head, used on shipboard to secure the edge of the hose to the scupper.

SCUPPERNONG, n. *skŭp'ėr-nŏng* [etym. doubt.]: a kind of grape found wild, and cultivated in the s. states. It is said to be a variety of *Vitis vulpina,* and to have been brought from Greece.

SCURF, n. *skėrf* [Ger. *schorf;* Dan. *skurv;* Dut. *schurft;* Sw. *skorf,* scurf, scab]: the white flaky matter formed on, and thrown off by, the skin, particularly that formed on skin covered with hair, as the head; any matter loosely adherent. SCURF'Y, a. *-ĭ,* covered with scurf, or resembling it. SCURF'INESS, n. *-ĭ-nĕs,* the state of being scurfy.

SCURRILE, a. *skŭr'rĭl* [L. *scurrīlis,* jeering, scurrilous —from *scurra,* a buffoon, a jester: It. *scurrile*]: befitting a buffoon or jester; grossly opprobrious; low; mean; scurrilous. SCURRILITY, n. *skŭr-rĭl'ĭ-tĭ,* vile or obscene jocularity; mean buffoonery; gross or obscene language. SCURRILOUS, a. *skŭr'rĭl-ŭs,* grossly opprobrious in language; using gross vulgarities only befitting a buffoon; lewdly jocular. SCUR'RILOUSLY, ad. *-lĭ.* SCUR'RILOUSNESS, n. *-nĕs,* the quality of being scurrilous; indecent grossness of language.—SYN. of 'scurrilousness': insolence; vulgarity; indecency; abuse;—of 'scurrilous': abusive; reproachful; vulgar; foul; low; indecent; infamous; mean; opprobrious; insulting; insolent; offensive; vile; gross; foul-mouthed.

SCURVY, a. *skėr'vĭ* [corruption of SCURFY]: scabby; covered with scabs; thin, shabby, or mean; sorry; in *OE.,* vile; worthless; offensive. SCUR'VILY, ad. *-vĭ-lĭ,* in a scurvy manner; basely; meanly. SCUR'VINESS, n. *-nĕs,* vileness; meanness.

SCURVY, n. *skėr'vĭ* [mid. L. *scorbūtus;* F. *scorbut;* OF. *scurbut,* scurvy: prov. Eng. *scorvy;* Ger. *scharbock,* scurvy]: disease characterized by livid spots of various sizes on the skin, and by a general debility; caused by confinement, lack of fresh food and vegetables, and of exercise; affecting chiefly sailors on long voyages—formerly very fatal, but now generally prevented or cured by free use of lime-juice, and of potatoes and canned vegetables. SCUR'VINESS, n. *-vĭ-nĕs,* the state of being affected by scurvy.—*Scurvy* or Scorbutus is characterized by a depraved condition of the blood. In consequence of this morbid state of the blood, there is great debility of the system at large, with tendency to congestion, hemorrhage, etc., in various parts of the body, especially in the gums. Scurvy has probably existed from the earliest times, but the first distinct account of it is contained in the history of the crusade of Louis IX., in the 13th century, against the Saracens of Egypt, during which the French army suffered greatly from it. In the 16th century it prevailed endemically in various parts of n. Europe, and it seems to have abated only a little over a century ago. It was in badly-fed armies, in besieged cities, and on board ship, that its ravages were

most appalling, and it is believed that more seamen perished from scurvy alone than from all other causes combined, whether sickness, tempest, or battle.

Scurvy closely resembles Purpura (q.v.) in general symptoms; but there are leading points of difference; indeed essentially the two are different.

Lemon-juice or lime-juice—though its virtues had long been known—was not made an essential element of British nautical diet till 1795. In 1870 the number of cases of scurvy received into Haslar Hospital (a naval hospital) was 1,457; in 1806 there was only one case, and again in 1807 only one case. Many naval surgeons of the present day have never seen a case of scurvy. The potato, cooked or raw, has almost equal antiscorbutic properties with lime-juice. If necessary, constipation must be relieved by mild laxatives, and the appetite may be stimulated by bitter tonics.

SCURVY-GRASS, n. *skėr'vĭ-grăs* [said to be named from its use as a cure for *scurvy:* comp. Dan. *skeeurt*—*lit.*, spoonwort—from *skee*, a spoon; *urt*, a root] (*Cochlearia*): genus of plants of nat. order *Cruciferæ*, having small white flowers and many-seeded pouches. They are annual or biennial, rarely perennial, plants; of humble growth, with branched smooth stems, smooth simple leaves, and terminal racemes of flowers. They have an acrid biting taste, containing the same pungent volatile oil which is found in horse-radish, and are valued for anti-scorabutic properties. COMMON SCURVY-GRASS (*C. officinalis*) is sometimes 12 inches high; the root-leaves are stalked and heart-shaped; the pouches globose, ovate, or elliptical. It is a variable plant, and some of the other species described by botanists are probably not essentially different: they have the same properties. Scurvy-grass is a very widely distributed plant, found on the shores of almost all parts of the world, also on high mountains. *Barbarea præcox*, a winter-cress cultivated as a salad, is also known as scurvy-grass, and is becoming naturalized in the United States.

'SCUSE: for EXCUSE in Shakespeare.

SCUT, n. *skŭt* [Icel. *skott*, a rabbit's tail: W. *cwt*, a tail; *cwta*, bob-tailed: Gael. *cut*, a piece, a bob-tail]: the tail of a hare, or other animal having a short tail.

SCUTA, n. plu. *skū'tă* [L. *scūtum*, a shield]: any shield-like plates, especially those developed in the integument of many reptiles.

SCUTAGE, n. *skū'tāj* [mid. L. *scutāgĭum*, scutage—from L. *scūtum*, a shield]: in *anc. feudal law*, a tax sometimes levied by the crown as a substitute for knight-service, or for personal service due from a vassal or a tenant to his superior. It was afterward commuted for a pecuniary satisfaction and became a parliamentary assessment, the custom of commuting service having become general and the rate of commutation variable.

SCUTARI, *skô'tâ-rē* (Italian or Levantine form of Turkish *Usküdar*): town of Asiatic Turkey, on the e. shore of the Bosporus, immediately opposite Constantinople, of which it may be considered a suburb. It is on the sides and summit of a hill, sloping irregularly up from the water's edge; and both externally and internally has great resemblance to the Turkish capital. It contains several mosques, bazaars, and baths, a college of howling dervishes, manufactories of silks and cotton fabrics, corn warehouses, and *imarets* or kitchens for the poor. It has long been famed for its extensive cemeteries, adorned with magnificent cypresses, the chosen burial-place of many of the Turks of Constantinople, from their attachment to the sacred soil of Asia, and the traditionary belief that their race will in some coming day be driven out of Europe: probably more than 3,000,000 of them are buried here. This town acquired notoriety in connection with the English army during the Russian war (1854-56), when the enormous barracks built by Selim III., on the s. outskirts of the town, were occupied as barracks and hospital by the English troops, and formed the scene of Miss Nightingale's labors. They form a vast quadrangle, with corridors whose total length is estimated at 4 m. A little s. of the General Hospital, on the cliffs bordering the Sea of Marmora, is the densely-filled English burial-ground, where Baron Marochetti's monument in honor of the 8,000 troops that lie there has been erected.—Scutari is a place of considerable traffic, and is the rendezvous and starting-point of caravans and travellers trading with Syria and interior Asia. It occupies the site of the ancient *Chrysopolis;* and about 2 m. s. lies the village of Kadiköi, anc *Chalcedon.*—Pop. of Scutari, estimated 60,000, nearly all Mohammedan.

SCU'TARI (Turkish *Iskandere,* anc. *Scodra*): town of European Turkey, in n. Albania, cap. of the sanjak of Scutari; at the s. end of the Lake Scutari, at the point where the Bojana, issuing from it, is joined by the Drinassi. The lake is about 20 m. long, and abounds in fish. Scutari is a fortified town, with an old Venetian fortress on a commanding height: the town is straggling and ill-built. It has manufactories of arms and cotton goods, a bazaar, and ship-yards for building coasting-vessels. It has a large trade: the exports include wool, wax, hides, skins, tobacco and dried fish, sent to Trieste, Venice and Avlona. The imports are colonial produce, silk, and other manufactured goods which are sold at the large fairs. Pop. 35,000, largely Mohammedans, with some Roman Catholics.

The province or Sanjak of Scutari contains 4,516 sq.m., and has a population of 322,000. The Lake of Scutari is 20 m long by 6 m. wide; on the northwest it receives the Moracca. The Bojana forms its outlet into the Gulf of Drino in the Adriatic Sea.

SCUTATE, a. *skū'tāt* [L. *scūtātus*, armed with a long shield—from *scūtum*, a shield]: in *bot.*, shaped like an anc. round buckler; in *zool.*, having a surface protected by large scales. SCUTA'TA, n. *-tā ta*, in *entom.*, shield-bugs; a family of *Geocores*. They feed on the juices of trees and shrubs, occasionally attacking caterpillars. Some of the tropical species have splendid metallic tints, and fly in the sunshine.

SCUTCH, v. *skŭch* [Norw. *skoko*, *skuku*, a swingle for beating flax: comp. Gael. *sguids*, to switch, to dress flax]: to beat off or separate the woody parts of the stalks of flax by means of an instrument called a SCUTCHER—all the operations of dressing flax are now usually performed by a mill. SCUTCH, n. the scrapings of hides. SCUTCH'ING, imp.: N. the process of separating hemp or flax from the woody stalk. SCUTCHED, pp. *skŭcht*.

SCUTCHEON, n. *skŭch'ŭn* [an abbreviation of ESCUTCHEON, which see]: the ornamental piece of metal-plate or of ivory, mother-of-pearl, etc., round a key-hole; an escutcheon. See SHIELD.

SCUTE, n. *skūt* [L. *scutum*, a buckler; in *OE.*, a small shield:] a scale, as of a fish or reptile; an ancient gold coin of France, valued at about 80 cents; the iron heel of a boot.

SCUTELLA, n. *skū-tĕl'la* [L., a salver, dim. of *scutra*, a tray]: in *comp. anat.*, the horny plates with which the feet of birds are covered, especially in front.

SCUTELLUM, n. *skū-tĕl'lŭm* [L. dim. of *scŭtum*, shield or buckler]: in *bot.*, an outgrowth of the axis beneath the cotyledon in the embryo of grasses; a sort of rounded shield like fructification of some lichens. SCUTELLIFORM, a. *skū-tĕl'lĭ-fawrm* [L. *forma*, shape], or SCUTEL'LATE, a. *-lāt*, shaped like a shield.

SCUTIFORM, a. *skū-tĭ-fawrm* [L. *scūtum*, a shield; *forma*, shape]: shaped like a shield. SCUTIF'EROUS, a. *-tĭf-ĕr-ŭs* [L. *scūtum*, a shield; *fero*, I bear]: bearing a shield or buckler.

SCUTTLE, n. *skŭt'tl* [AS. *scutel;* Ger. *schüssel;* Dut. *schotel*, a dish, a bowl: L. *scutel'la*, a dish]: a broad shallow basket; a metal pan pail for holding coals.

SCUTTLE, n. *skŭt'tl* [OF. *escoutilles*, the hatch of a ship: Sp. *escotilla*—from *escotar*, to slope, to hollow a garment about the neck]: in *ships*, a small hatchway or opening in the deck by which things are let down into the hold: a square hole in a roof with a movable cover: V. to cut holes in the bottom, the sides, or deck of a ship or boat for any purpose, generally for sinking her. SCUT'TLING, imp. *-tling*. SCUT'TLED, pp. *-tld*. SCUTTLE-BUTT or -CASK, a cask of water, with a square hole, placed on the deck of a ship for immediate requirements.

SCUTTLE, v. *skŭt'tl* [a corruption of *scuddle*, a dim. of SCUD, which see:] to run with precipitation; to hurry furtively away: N. a running with affected haste; a quick bustling run. SCUT'TLING, imp. SCUT'TLED, pp. *-tld*.

SCUTTLE-FISH: for **Cuttlefish**, which see.

SCUTUM, n. *skū'tŭm* [L. *scūtum*, a shield]: in *Rom. antiq.*, oblong or semi-cylindrical shield of the heavy-armed Roman soldier; in *anat.*, the knee-pan or patella.

Various Forms of the Roman Scutum.

SCYBALA, n. plu. *sĭb'ă-lă* [Gr. *skubălon*, dung, ordure]: the feces or contents of the bowels, when passed in hard small masses, like marbles or the excretions of sheep, denoting an unhealthy and costive habit.

SCYE, n. *sī* [F. *scier*, to saw —from L. *secārĕ*, to cut]: the arm-hole of a coat, a vest, or a shirt, etc., before the sleeve is sewed in.

SCYLLA, *sĭl'lâ*, and CHARYBDIS, *ka-rĭb'dĭs:* rock and whirlpool on the w. coast of s. Italy, between Italy and Sicily—the rock (Scylla) jutting out boldly into the sea, and forming a small peninsula at the n. entrance to the Straits of Messina: the whirlpool (Charybdis) in the Straits nearly opposite the entrance to the harbor of Messina. About the beginning of B.C. 5th c., a fort was built upon the rock (which is about 200 ft. high, and much hollowed out below by the action of the waves); and later a small town grew up, straggling down the slopes toward the sea. The navigation at this place was regarded by the ancients as attended with immense danger, which seems greatly exaggerated, for at the present day the risk is not more than attends the doubling of any ordinary cape. The rock, according to the Homeric legend (*Od.* xii. 73) which in later times became localized at the Straits of Messina, was the abode of a dreadful sea-monster, daughter of Cratæis, and named Scylla, possessing 12 feet, 6 long necks and mouths, each with three rows of sharp teeth, and who yelped like a dog, and snatched mariners out of passing vessels. There are other accounts of Scylla, one of which, in Ovid (*Metam.* xiv. 1–74), represents her as having been a beautiful maiden, beloved by the sea-god Glaucus, but who, by the jealousy of Circé, was changed into a monster having the upper part of the body that of a woman, while the lower part consisted of the tail of a fish or serpent surrounded by dogs.—The modern Scilla or Sciglio is a fortified town in the province of Reggio-Calabria, having large silk-works; pop. about 7,500, mostly seafaring people.

Charybdis (modern name *Galofaro*), the celebrated whirlpool, in ancient writings is mentioned always in conjunction with Scylla. The navigation of this whirlpool is, even at the present day, considered dangerous, and must have been exceedingly so to the small open ships of the ancients. A modern writer describes it as

being 'an agitated water of from 70 to 90 fathoms in depth, circling in quick eddies.' Homer places it immediately opposite Scylla, probably taking advantage of the poetic license to exaggerate the danger of the navigation, though, indeed, the whirlpool may have changed its situation since his days. The myth connected with it is, that under a large fig-tree, which grew out of a rock opposite Scylla, dwelt the monster Charybdis, who thrice every day sucked down the water of the sea, and thrice threw it up again.

According to the ancient myth, ships passing between these two dangers were said to have been wrecked by one while trying to avoid the other: hence in modern usage, 'Between Scylla and Charybdis,' between two great difficulties or perils.

SCYLLA: a character in mythology, the daughter of Nisus, king of Megara, who, when Minos came from Crete to attack Megara, in revenge for the death of his son, Androgeos, was led by her love for Minos to cut off from the head of her father, King Nisus, a purple lock of hair, which while it remained on the head of Nisus, made it impossible for Minos to take the city. Megara was captured and Nisus slain, and Scylla was either drowned, or changed into a fish which Nisus, changed into an eagle, constantly pursued.

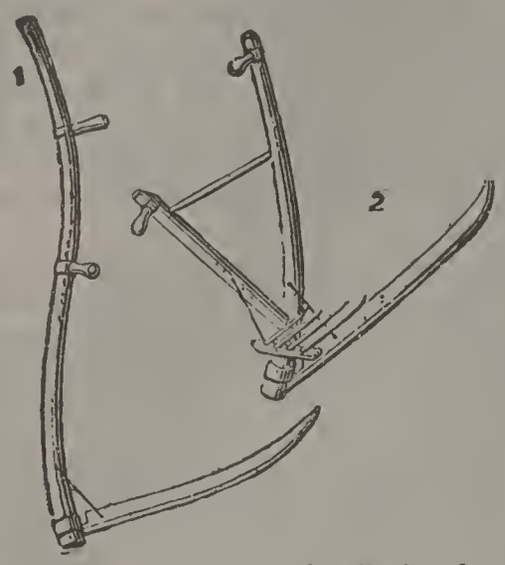
Also another Scylla, mentioned in the Odyssey, as a monster with twelve feet, six necks and six mouths, and occupying a rock on the Italian coast. Legends represent her as having been a beautiful woman changed into a monster through the jealousy of Circe or Amphitrite.

SCYMETAR. See CIMETER.

SCYPHUS, n. *sī'fŭs,* SCYPHI, n. plu. *sī'fī* [L. *scyphus;* Gr. *skuphos,* a cup or goblet]: in *classical antiq.,* a large drinking-cup used by the lower orders: in *bot.,* the cup of a narcissus; a funnel-shaped corolla; in some lichens the funnel-shaped expansion of the podetia—i.e., the erect branched or simple growths springing from the horizontal thallus. SCYPHIPHORA, n. *sī-fĭf'ō-ră* [Gr. *phoros,* bearing]: a shrub from the shores of the Mulucca Isles, constituting a genus of *Cinchonăcĕæ*—the flowers are in axillary corymbs, and have an undivided calyx.

SCYROS, *skī'rŏs* or *sī'rŏs,* or SKYRO, *skē'rō:* island of the Grecian Archipelago, largest of the n. Sporades, 25 m. n.e. of Eubœa or Negropont; length 19 m.; 60 sq.m. Scyros is very mountainous and uncultivated in the s.; but the n. part, though also hilly, has several fertile plains, which produce fine wheat. Other products of Scyros are wine, oil, oranges, madder, bees-wax, and honey. As in ancient times, the island is celebrated for its goats, also for its small but hardy race of horses. The only town in the island is Scyro or St. George, on a high peak on the e. coast, site of 'the lofty Scyros' of Homer. There are several relics of antiquity in the island. Pop. about 3,247.

SCYTHE, n. *sīth* [Icel. *sigd*, a sickle: Low Ger. *segede*, a kind of sickle: Gael. *sgud*, to lop, to prune]: a large slightly curved steel blade fitted at right angles to a long



1, Common Scythe; 2, Cradle Scythe.

pole, used in mowing grass or reaping grain (see REAPING). SCYTHED, a. *sīthed*, armed with scythes, as an anc. chariot. SCYTHE'MAN, n. one who works with the scythe in mowing.

SCYTHIA, *sĭth'ĭ-a:* name variously employed in ancient times to denote a vast, indefinite, and almost unknown territory, including the s. Russian steppe, n. and e. of the Black Sea, the Caspian, and the Sea of Aral. Its application seems to have been almost continuously extended to a wider region. But the term is not so much *geographical* as *ethnological*, and the only interest attaching to the barren catalogue of tribes and nations, given in the classical writers, springs from the hope of connecting these with a recognized race of modern times. Latham argues for the Scythians being the ancestors of the later *Turks*, and maintains their central and primitive abode to have been Independent Tartary, whence they spread w. round the Caspian into Russia, Transylvania, and perhaps even e. Hungary. Niebuhr and Neumann favor the hypothesis of a Mongol origin for the Scythians; while others regard them as Finns or Circassians. Zeuss finds evidence that the true Scythians were Aryans, akin to the Iranians; as Herodotus shows that their language was cognate to that of the Sarmatians (q.v.). In their mode of life they were mainly nomadic and pastoral, though we read of some trans-Danubian and Euxine tribes that were agricultural. Many of them were *Hippemolgi* ('mare-milkers').—The name Scythians seems to have been given in later antiquity to any remote, barbarous northern people, rude, fierce, and little known.

SCYTHIAN, a. *sĭth'ĭ-ăn:* pertaining to *Scythia*, a name variously applied in anc. times to indefinite regions of n. Europe and Asia now embraced in the Russian territories n. of the Black Sea, the Caspian, and the Sea of Aral: N. a native of Scythia.

SDAIN, or SDEIN, n. and v. *s'dān:* in *OE.* for DISDAIN. SDEINING, imp. *s'dān'ĭng.* SDEINED, pp. *s'dānd.* SDEINFUL, a. *s'dān'fŭl, OE.* for DISDAINFUL.

SE, *sē* or *sĕ* [L. *se,* without, aside, by itself—the primary form of L. *sĭnĕ,* without]: a prefix signifying 'aside;' a departing; a separating from, as in *secede,* to go aside.

SEA, n. *sē* [Icel. *sær;* Dan. *sö;* Ger. *see;* Goth. *saiws,* the sea, a lake]: vast collection of water, smaller than that of an ocean; the ocean (see below): a wave or large quantity of sea-water, as to ship a sea; the surging and swelling of the waves, as a heavy sea: any large quantity of water or other liquid; anything rough and tempestuous: in *Scrip.,* the term applied to the large basin or cistern made by Solomon: ADJ. of or relating to the sea, or connected with it. SEA-ACORN, another name for a BARNACLE, which see. SEA-ADDER, a fish of the British seas, of a slender form. SEA-AIR, the air above, near, or coming from the sea. SEA-ANEMONE, animal of very simple structure common in many seas, having many rows of tentacula or feelers, which when expanded give the appearance of a flower (see ANEMONE, SEA: ACTINIA). SEA BEACH, the land lying along the margin of the sea. SEA-BEAR, the white or polar bear; also a species of seal (see OTARY). SEA-BEATEN, a. lashed by the waves. SEA-BEET, the wild beet, or *Bēta maritĭma,* ord. *Chenopodĭācĕæ,* the parent of the different varieties of garden beet and mangel-wurzel. SEA-BELLS, the *Convol'vŭlus soldanel'la,* ord. *Convol'vulācĕæ.* SEA-BLUBBER, the jelly-fish. SEA-BOARD, n. the sea-shore; the coast; the nature and extent of the coast-line of a maritime country: ADJ. bordering upon the sea: AD. toward the sea. SEA-BOAT, a term applied to a ship to designate her qualities in bad weather at sea. SEA-BOUND, -ENCIRCLED, or -GIRT, a. surrounded by the sea. SEA-BREEZE, the wind blowing from the sea. SEA-BUCKTHORN, the *Hip'poph'aè rhamnoi'dēs,* ord. *Elæagnācĕæ.* SEA-CALF, a name given to the common seal. SEA-CAT (see CHIMÆRA: and for a different fish so called, see WOLF-FISH). SEA-COAL, coal that has been carried from a distant part by sea. SEA-COAST, land immediately adjacent to the sea. SEA-COB, the sea gull. SEA-COW, the popular name for the Manatee (q.v.); also for the walrus or sea-horse. SEA-CUCUMBER, marine animal, one species of which is used, when salted and dried, in China, as a delicacy, under the name *trepang;* a holothurian (see HOLOTHURIA). SEA-DEVIL, a hideous fish having a large head and vast mouth: the Fishing-frog or Angler (q.v.). SEA-DOG, the common seal: an old sailor. SEA-DUCK (see SCOTER). SEA-EAGLE (see ERNE). SEA-EAR, a mollusk with an ear-shaped univalve shell; the *haliotis.* SEA EGG, or SEA-URCHIN, animal, the echinus (see ECHINIDÆ). SEA-ELEPHANT, a large seal having a proboscis somewhat like an elephant (see ELEPHANT, SEA). SEA-FAN (see GORGONIA). SEA-FARER, n. *sē'fā-rĕr* [*sea* and *fare* (see FARE 1)]. one taking a journey by sea; a mariner. SEA'-FARING, a. *-rĭng,* following the occupation of a seaman. SEA-FENNEL, the samphire. SEA-FIGHT, a battle or action at sea. SEA-

FOWL, any fowl that lives on or near the sea, and obtains its food from it. SEA-FOX (see FOX SHARK). SEA-GAGE, the depth which a vessel sinks in the water. SEA-GIRKIN, *-gĕr'kĭn* [see GHERKIN]: a sea-cucumber or holothurian SEA-GOD, one of a fabulous class of beings supposed to preside over the sea. SEA-GOING, a. applied to a vessel sailing upon the deep sea, as distinguished from a river or coasting vessel. SEA-GRASS, the *Zostēra marīna*, known as sea-wrack or grass-weed, ord. *Naĭadācĕæ*. SEA-GREEN, a. of a faint green or sea color: N. a plant. SEA-GUDGEON, the black goby or rock-fish. SEA-HARE, a marine mollusk having a fancied resemblance to a hare; the *aplysia*. SEA HEDGEHOG, the sea-urchin. SEA-HOG, the Porpoise (q.v.). SEA-HORSE, the walrus (see MORSE); also a species of pipe fish, the HIPPOCAMPUS (q.v.). In *her.* a fabulous monster having its upper part like a horse, but with webbed feet, and united to the tail of a fish: a scalloped fin extends down the back. SEA-JELLY, one of the jelly-like animals called *Medusæ*. SEA-KALE, name applied to several plants of the cabbage tribe (see below). SEA-KINGS, the Northmen pirate-kings who infested the coast of Europe in the 8th and 9th c. SEA-LARK, a bird of the sandpiper kind; the ringed dotterel or plover. SEA-LAWS, mediæval collections of recognized usages of the sea: see MERCANTILE LAW: HANSEATIC LEAGUE: OLÉRON, LAWS OF: NAVIGATION LAWS. SEA-LEGS, ability to walk on a ship's deck when pitching and rolling. SEA-LEOPARD, a marine animal of the seal family, spotted like a leopard. SEA-LEVEL, the level of the surface of the sea; any part whose surface is on the same level as the sea; the surface of the open sea taken as the point from which to estimate or measure the perpendicular heights or depressions of other surfaces, as of hills and mountains. SEA-LION, a popular name for those eared seals that have manes like lions (see OTARY). SEAMAN, n. *sē'măn*, a sailor or mariner; one who assists in the management of a ship at sea as his ordinary occupation (see SEAMEN). ABLE-BODIED SEAMAN, one who thoroughly understands the duties of a seaman, and is able to perform them efficiently; contracted A.B. ORDINARY SEAMAN, one less competent than an able seaman. SEA'MANSHIP, n. *-shĭp*, knowledge of the art of managing and navigating a ship; the skill of a seaman. SEA-MARK, any elevated object on land which may serve for the direction of mariners. SEA-MAT, the common flustra, one of the polyzoa. SEA-MEW, *-mū*, a sea-gull. SEA-MONSTER, any huge animal whose habitat is the sea. SEA-MOUSE, an annelid animal found in the sea (see below). SEA NEEDLE, a fish having a slender body, long pointed jaws, and a forked tail; the garfish. SEA-NETTLES, certain kinds of jelly-fish which irritate or sting the skin when touched (see ACALEPHÆ). SEA-NYMPH, nymph or goddess of the sea. SEA-ONION, sea-side plant, also called the *squill*,

Sea-horse.

which see. SEA-OOZE, soft mud on the sea-bottom. SEA OTTER, a kind of otter found in the north Pacific, having fur extremely soft, and of a deep glossy black. SEA-PAD, a star-fish. SEA-PARROT (see AUK). SEA-PIE, a sea fowl, the Oyster-catcher (q.v.): dish of food, common at sea, consisting of butcher-meat covered or inclosed with a thick paste of flour. SEA-PIECE, representation of a scene at sea. SEA-PINK, or SEA-THRIFT (see THRIFT). SEA-PORCUPINE (see DIODON). SEAPORT, a city or town having a harbor on or near the sea. SEA-RAVEN (see BULLHEAD). SEA-RISK, hazard at sea. SEA-ROBIN (see GURNARD). SEA-ROOM, distance from land sufficient for a ship to avoid danger of shipwreck on the coast, or of collision. SEA-SALT, common salt obtained from sea-water by evaporation. SEA-SICK, a. affected by the nausea caused by the rolling and pitching of a vessel at sea (see SEA-SICKNESS). SEASIDE, land or country adjacent to the sea (see SEA-SHORE). SEA-SLUG, the trepang or sea-cucumber (see HOLOTHURIA). SEA-SNAKE, a kind of snake commonly found in the seas of warm latitudes. SEA-SNIPE (see TRUMPET-FISH). SEA-SPIDER, or SPIDER-CRAB (see CRAB). SEA-SQUIRT (see ASCIDIA). SEA-SWALLOW, the common tern (see TERN): the stormy petrel. SEA-TANGLE, a common name for several species of sea-weed. SEA-TOSSED, violently moved about by the waves of the sea. SEA-UNICORN, the Narwhal (q.v.). SEA-URCHIN, an echinus (see ECHINIDÆ). SEA-WALL, strong wall built to resist the encroachments of the sea. SEAWARD, a. or ad. toward the sea, or directed toward it. SEA-WARE, sea-weeds, and the like, thrown up on the shore by the sea. SEA-WATER, natural water of the sea. SEAWEED, plants found growing in the sea. SEA-WOLF, species of seal: a fish so named from its fierceness and ravenousness (see CHIMÆRA: for a different fish so called, see WOLF-FISH). SEAWORTHY, applied to a ship in good condition and fit in all respects for a sea voyage. SEA-WRACK, Sea-grass (q.v.): see also FUCACEÆ: WRACK. AT SEA, away from land; upon the ocean; in a vague uncertain state. BEYOND THE SEA, out of a state or country, and in another which has been reached by sea. CROSS SEA, a sea when its waves move in different directions, also called a CHOPPING SEA. HALF SEAS OVER, half drunk. HEAVY SEA, the sea when the waves run high. ON THE HIGH SEAS, in the open ocean, as being the common highway of nations. TO GO TO SEA, or TO FOLLOW THE SEA, to follow the occupation of a sailor.

SEA: in its general signification, that vast expanse of salt water which covers the more depressed portion of the earth's surface, fills up each hollow and rift to a certain uniform level, completing as far as possible the spheroidicity of the globe, and divides its surface into two great and innumerable smaller portions—the old and new worlds and their islands. This immense body of water is distributed with not the least approach to regularity; but here forms a huge basin, there becomes a long and tortuous inlet or strait, which narrows or widens as the configuration of the land-surface on each side permits; nor is

is placed symmetrically to the earth's axis of rotation, for the hemisphere of which the s.w. corner of England is the centre or pole contains the whole of the land-surface, if we except the triangular portion of S. America s. of Uruguay, Australia, New Zealand, the most of the East Indian Islands, and the land around the s. pole (of unknown extent). The other hemisphere is, with these exceptions, wholly water. From this irregular distribution of the sea over the earth's surface, and from the specific gravity of water being about $\frac{1}{6}$ of that of the land, it necessarily follows that the centre of gravity of the whole globe does not correspond accurately with its centre of figure. The extent of sea-surface is estimated at 144,712,850 sq. m., or nearly $\frac{3}{4}$ of the whole of the earth's surface; and its mass, on the supposition of an average depth of 2 m., is about $\frac{1}{4000}$ of that of the whole globe; such estimates, however, can be considered at best only rough approximations. One of the most remarkable features of the sea is its continuity or oneness; for though numerous large stretches of salt water, e.g., the Sea of Azov, Black, Mediterranean, and Baltic Seas, the Gulf of Mexico, and others, have barely avoided becoming detached lakes, very few detached lakes are found on the earth's surface; and with the exception of the Caspian and Aral Seas, they are of small size.

Composition, Specific Gravity, and Temperature of the Sea.—The ocean consists of salt-water, and from its continual motion, under the influence of currents and waves, preserves, generally speaking, uniform saltness. Under special circumstances, however, the saltness increases, as by the excess of evaporation over the fresh-water influx in the Mediterranean and Red Seas, and about the n. and s. limits of the tropical belt; and decreases, by the contrary cause, in the Sea of Azov, Black Sea, Baltic Sea, and in the polar regions. See TRADE-WINDS. The origin of the saltness of the sea is accounted for when we consider that the chloride of sodium and other soluble salts which form constituent ingredients of the globe, are being constantly washed out of the soil and rocks by rain and springs, and carried down by the rivers; and as the evaporation from the sea which feeds the rivers carries none of the dissolved matter back to the land, the tendency is to accumulate in the sea. The principal ingredients in sea-water are chloride of sodium or common salt, with salts of magnesia and lime: for a more exact analysis, see WATER. The average specific gravity of the sea, out of reach of the exceptional action of the melting of snow, rain, or river-water, is (at 62° F.) 1·02655. The slight variations in the saltness of the sea necessarily produce corresponding changes in its specific gravity; accordingly, on the n. and s. limits of the torrid zone the mean specific gravity of the sea is, in different longitudes, 1·02785, 1·0268; while at the equatorial calm-belt it is 1·0252, 1·0267; and on the whole shows a tendency to diminish as the latitude increases, Beechey having found it 1·0258 in lats. 55°—60° n. and s. in the Pacific, and King 1·0255 in corresponding latitudes in the

Atlantic. It is considerably diminished near the mouths of rivers, and in those inlets or semi-lacustrine arms which are the depositories of more river-water than compensates for their evaporation, as in the Black Sea, where it is 1·0143, and in the Baltic, only 1·0086.

The temperature of the sea, where it is not affected by currents from a warmer or colder region, necessarily corresponds to the normal temperature of the latitude; but this is true only of the water at and near the surface, for it has been recently proved by observations on deep-sea temperature by Carpenter, Wyville Thomson, and others, that the temperature rapidly diminishes with the depth, particularly in tropical and temperate regions, till at great depths ice-cold water is everywhere found. Thus, from the extensive observations made by H. M. S. *Challenger* in the n. Atlantic 1873, it is shown that at the equator, where the surface-temperature is about 80°, the decrease with the depth is so rapid, that at 60 fathoms from the surface the temperature is only 61°·5; at 150 fathoms it is 50°; at 700 fathoms the temperature has fallen to 40°; at about 1,600 fathoms, to 36°. Below this it diminishes at a much slower rate, till it falls nearly to freezing at all great depths which are connected by under-currents with the Antarctic or Arctic Seas. The sea-water of the upper 60 or 80 fathoms is affected by the solar heat. Immediately beneath this sun-heated upper stratum, it is remarkable that all the water in the n. Atlantic, as far as lat. 40°, is warmer than that at the same depth under the equator. The mean temperature of the upper 1,500 fathoms in the n. Atlantic is 4°·5 warmer than the same upper stratum at the equator. As regards the temperature of the water at the bottom, at all stations between Bermuda and the equator on the e. side of the Atlantic, the temperature is remarkably uniform at 35°·2; in the Bay of Biscay, to the n.e. of this line, it is 1° warmer; s.w. of the same line, 1° colder; whereas, further s. at the equator, on the w. side of the Atlantic, it is 32°·4, or 2°·8 colder. This last fact is very important, since, from the fact that at the equator the bottom temperature is 32°·4, and that at all stations n. of it the bottom temperature is warmer, it follows that the cold water at the bottom of the Atlantic, as far n. as the Azores and Bay of Biscay, equally with that at the equator, is derived from an Antarctic, and not from an Arctic source. This cold Antarctic current, entering the n. Atlantic, is found between 1,700 fathoms and the bottom, a total thickness of 700 fathoms. Ice-cold water has been found at the bottom in the Arabian Sea also. In land-locked seas, such as the Mediterranean, whose deep water is not in communication with that of the Atlantic, owing to the shallowness of the sea at the Straits of Gibraltar, the bottom temperature does not fall so low as that of the ocean. Thus the temperature of the Mediterranean at 1,508 fathoms is 55°, whereas at this depth in the ocean it is as low as 36°. See ISOTHERMAL LINES. The highest surface-temperature does not correspond with the equator, but owing to the disturbing influence of currents is in the following regions: between Sumatra and the

Zanzibar coast; e. of the Philippine Islands, to long. 170° e.; e. of Cuba and Florida; and n.e. of Cape St. Roque.

Color and Phosphorescence of the Sea.—The color of the ocean, when free from admixture of foreign substances, e.g., animalcules, vegetable organisms, excessive rain, or the tinted waters of swollen rivers, is a pure deep blue, which becomes less marked where the water is of less depth. A 'different' color of sea-water is due to the presence of some foreign substance, e.g., the red, brown, and white patches of the Pacific and Indian Oceans, to the presence of swarms of animalcules; and the colors of the Red and Yellow Seas, to matters of vegetable origin. The Rhone, at its emergence from the Lake of Geneva, and the lake itself, exhibit an intensity of blue far surpassing that of any sea. The phosphorescence of the sea is due to the presence of myriads of invertebrata, especially rhizopoda, tunicata, etc.: see LUMINOSITY OF ORGANIC BEINGS.

Depth of the Sea.—Till very recently, it might be said that, except the more frequented strips along the coast, and such other portions as afforded anchorage-ground, our knowledge of the depth of the ocean amounted to nothing. It is true that deep-sea soundings had been frequently made, but from the necessary defectiveness of the ordinary 'lead,' and inattention to the effect of under-currents in destroying the perpendicularity of the line, little dependence could be place on the results. It is chiefly in the Atlantic that the new and trustworthy method of sounding (see SOUNDING, DEEP-SEA) has been practiced, and the contours of its bottom may now be considered as fairly ascertained. The greatest depth measured by the *Challenger* (n. lat. 19° 41′, w. long. 65° 7′) was 3,875 fathoms, or 23,250 ft. (about 4·4 m.). Over a great extent of the area, the depth ranges between 2,000 and 3,000 fathoms. Along the middle runs an irregular ridge, on which the depth is less than 2,000 fathoms, and n. of 50° a plateau of similar depth extends, with little interruption, from Ireland to Newfoundland, on which the telegraph cables are laid. Nowhere round the British Isles is the sea deeper than 400 ft. In the Pacific, several tracks of soundings were obtained during the *Challenger* expedition (1873–75). From the numerous islands which stud the Pacific, one might be led to assume its comparative shallowness; but this is far from being the case, for the islands rise abruptly from the bottom, and very deep soundings have been obtained near their shores. Over a great part of the area, the depth is over 2,000 fathoms; in the deeper parts, it ranges from 3,000 to over 4,000 fathoms. The deepest sounding got 4,475 fathoms (26,850 ft., or more than 5 m.), n. lat. 11° 24′, e. long. 143° 16′, near the Ladrone Islands. From the remarkable gentleness of slope of the bed of the Arctic Ocean n. of Siberia, the line giving only 14–15 fathoms at 150 m. from the shore, and from the configuration of its bed n. of America, it is generally concluded to be by far the shallowest of the oceans. Of the depth of the Antarctic Ocean, little is *known*, but it is supposed to be deeper than its antipodal kinsman. Near the Antarctic Circle, s.e. from Kerguelen,

the *Challenger* took a few soundings varying from 1,300 to 1,975 fathoms. From all hitherto observed, the land-surface under water seems the counterpart as regards eminences and hollows, chasms, valleys, plateaus, etc., of the land-surface above. See CHALLENGER EXPEDITION; DREDGE; ATLANTIC OCEAN; PACIFIC OCEAN; HYDROGRAPHY; SOUNDING, DEEP-SEA.

Motion of the Sea.—The sea is in a state of perpetual restlessness, its motion being either a vertical oscillation, or an actual transference of its waters from one place to another. The first motion, which constitutes *waves*, is due either to the attraction of the sun and moon on such a mobile body as the sea, or to the impulsive action of the winds which blow over its surface; the second motion arises from the sun, which, directly through its heat, and indirectly by scorching dry winds, produces evaporation, to a great extent, of the parts most exposed to its influence, and by its similar action on the atmosphere causes a transference of this vapor to remote latitudes, where it descends as rain, and, destroying the equilibrium of the sea, gives rise to *currents*. For the nature of these currents, see GULF STREAM: for the chief currents of each ocean, see the title of each ocean. This constant motion of the sea is of great service in tending to equalize the temperature of different parts of the globe; it also produces remarkable changes in the form of coasts, eating into rocks, converting low-lying lands into shoals and sand-banks, or carrying away the earthy materials, and depositing them in some distant region. The erosive action of the sea is generally almost imperceptible during several years, but in course of two or three centuries the magnitude of the changes effected by it is almost incredible.

On the economic value of the sea as a purifier and as a commercial highway, it is unnecessary to dilate. For some peculiar phenomena of the sea, see ICEBERGS; AURORA BOREALIS; WHIRLPOOLS; CORAL; the five great oceans (see OCEAN); etc.

The term *Sea* is applied in a more limited though indefinite sense to an offshoot of one of the oceans, as to the Black, Baltic, Red, Okhotsk Seas, to any portion of an ocean which from its position or configuration is considered deserving of a special name, and to the two great inland salt lakes of central Asia, the Caspian and Aral Seas: see these and similar titles: also DEAD SEE.—See further, POLAR EXPEDITIONS; GEOGRAPHY; METEOROLOGY; etc.

SEA, SOVEREIGNTY OF THE: right formerly claimed for England, by Blackstone, who contended that the main or high seas are part of the realm of England, as the courts of admiralty have jurisdiction there; though he granted that they are not subject to common law. But the law of nations, as now universally understood, recognizes no dominion in any one nation over the high seas, which are

the highway of all nations, and governed by the public law of the civilized world. A right of British sovereignty has, however, long been claimed over the four seas surrounding the British Isles: it was strongly asserted by Selden, and denied by Grotius; and measures were taken to vindicate the right in the reign of Charles I. Every nation has undoubtedly a right to the exclusive dominion of the sea within a certain distance from its shore, depending on the usage of the country. This right of lordship includes the right to free navigation, to fishing, to taking wrecks, the forbidding passage to enemies, the right of flag, of jurisdiction, etc. See INTERNATIONAL LAW; BLOCKADE; NEUTRALS.

SEA-ACORN, or ACORN-BARNACLE: a barnacle of the family *Balanidæ*. See BARNACLE.

SEA'-ANEM'ONE: a popular name, having reference to their flower-like aspect, for certain polyps or cœlenterate animals belonging to the suborder *Actinaria* of the order or class *Anthozoa*. The sea-anemones are sac-like animals of a more or less cylindrical form, usually fixed by a base or foot to some firm body, and with a disk at the opposite end in which is the slit-like mouth surrounded by whorls of simple hollow tentacles in greater or less number, but nearly always some multiple of six. From the mouth a short tubular gullet or œsophagus reaches into the cavity of the body, to the walls of which it is connected by radiating septa or mesenteries, which divide the body-cavity into a corresponding number of sacs, with all of which the œsophagus communicates by a central space into which the septa do not reach. Most of the anemones live singly, but some are colonial, in which case they never, like the closely related stone corals, form an internal limy skeleton, but may form a superficial one in the ectoderm. Generally they live attached to rocks or piles, but a few burrow in mud or sand, some as commensals fix themselves to shells inhabited by hermit crabs, etc., and a few are truly parasitic in jellyfishes. All are marine; most sublittoral, some deep-sea and a very few pelagic. They reproduce both asexually by budding and fission and sexually by eggs and spermatozoa, which are usually produced by different individuals. The eggs are fertilized in the gastric cavity and escape from the mouth in most cases as minute free-swimming larvæ or planulæ which soon attach themselves, develop mouth, tentacles and mesenteries, the latter in a definite order, until the adult structure is attained. Sea-anemones are carnivorous, but, having very limited powers of locomotion, are dependent upon such food as falls upon the expanded tentacles and peristome. This is captured through the paralyzing effect of the stinging cells or engulfed by the infolding tentacles and passed through the mouth into the gastric cavity for digestion, the undigested portion being rejected through the mouth. They will devour a surprising quantity of food and grow rap-

idly; and if starved, gradually shrink to almost the point of disappearance without losing their form. The species are quite numerous and are chiefly distinguished by the arrangement of the septa and tentacles, with color, form, etc., as minor characteristics. Most of them and particularly the tropical forms are beautifully colored. A large, handsome and variable species very common on the rocky shores of New England is *Metridium marginatum*, which makes an interesting inmate of the marine aquarium.

SEA-BASS: a fish (*Centropristis striatus*) of the family *Serranidæ*, also known as the black-fish, etc. It commonly attains the length of about a foot and a weight of 2 to 4 pounds, and is readily known by the large mouth with the teeth of moderate and nearly uniform size, the smooth area on top of the head, the rather large very rough stenoid scales, continuous dorsal fin with very strong spine and the slightly trilobate tail with a short filamentous tip to the upper angle. The color is mottled blackish, with more or less evident parallel pale streaks. The sea-bass is well known along the entire Atlantic coast of the United States and is very common from Cape Cod to the mouth of Chesapeake Bay. It lives on rocky ledges wherever an abundance of food offers itself, and feeds voraciously upon all sorts of small crustaceans, fishes, squids, and other mollusks, etc. The sea-bass is a sluggish bottom-loving fish, but appears to be somewhat migratory. It spawns in June and the eggs are of small size and buoyant. During the summer large numbers of the young collect in the shallow bays, where eel-grass grows in abundance. Owing to its abundance and the readiness and determination with which it takes the hook this is deservedly a favorite with anglers who lack the opportunity or skill to cope with nobler game. The fishing is done with hand-lines in from 5 to 20 fathoms of water, a heavy lead and a stout hook, preferably baited with squid, being required. Where they are plentiful two fish are frequently brought up simultaneously on as many hooks and large strings are taken during a single slack water, which is the time best suited to their capture. For the market large numbers of sea-bass are taken by lines and in pound nets on the coasts of New Jersey and Masssachusetts. The firmness, whiteness and sweetness of its flesh makes this a table favorite, especially for chowder. The sea-bass is readily propagated artificially, but there has been no necessity for entering upon this work on a large scale. The name is also sometimes applied to various other more or less closely related species.

SEA-BEANS: very hard-shelled seeds of tropical plants carried by ocean currents, and deposited on various beaches, where they occasionally take root. Those washed up on the Florida sands take a high polish and are made into jewelry and souvenirs. The polished, marble-like, pale-gray seeds are those of a tall Central American shrub (*Cæsalpinia bonducella*); they are known in their

native country as the nicker or bondue nuts, and are employed for necklaces and by Indian doctors as a tonic and vermifuge. Other common sea-beans are flattened, like lima beans, with a pitted or granular surface, and are of various sizes and hues, ranging through shades of red and brown to black or mottled. These are the fruits of species of *Mucuna,* climbing shrubs widely dispersed through the tropics, and very annoying to travelers, as the seed-pods are covered with stinging hairs, easily detached.

SEA-BREAMS: fishes of the marine family *Sparidæ,* represented in the United States by the sheepshead and its congeners. They are coast-fishes of moderate size, distributed throughout the warm and temperate parts of the world, and are usually of dark coloration. They are distinguished by the strength and elaboration of their teeth, fitting them for seizing and chewing crustaceans, mussels, and shellfish of all sorts. The fish most famous under this name is probably that of the Mediterranean *Chrysophrys aurata,* called gilthead in England, which sometimes reaches a weight of 20 pounds, and was one of the kinds fattened by the Romans of the classic age in fish ponds and regarded as especial delicacies.

SEABURY, *sē'bĕr-ĭ,* SAMUEL, D.D.: first Protestant Episcopal bishop of Connecticut: 1729-1796, Feb. 25; b. Groton, Conn.; son of Samuel Seabury, who was originally a Congregational preacher, afterward Episcopal rector at New London, and at Hempstead, N. Y. Young Seabury graduated at Yale 1748, studied theology under his father, and afterward medicine at Edinburgh, Scotland. Ordained deacon and priest by the bishop of Lincoln, England, he ministered at New Brunswick, N. J., 1754-57, at Newtown, Long Island, 1757-67, and at Westchester, N. Y. His anti-revolutionary pamphlets caused his imprisonment at New Haven a few weeks, after which he was chaplain of the king's troops in New York, also supporting himself by practicing medicine. He was elected bishop by the clergy of Connecticut, and went to London to be consecrated to that office; but a delay occurred of more than a year because one who was not an English subject could not take the oath of allegiance required of English bishops. He was at last invested with the office by Scottish prelates, who had no temporalities to lose, the ceremony taking place at Aberdeen 1784. Afterward, 1789, he united with English bishops in consecrating Bishop Claggett, through whom all the Protestant Episcopal bishops of the United States trace their ecclesiastical descent, and in whom a double line of episcopal authority—that of the Scottish and the English Church—was united. Bishop Seabury lived in New London till his death, officiating also as rector of St. James Church. He was the first to preside as bishop in the Episcopal convocations of a number of states. His publications, other than political, were several volumes of sermons;

and his life and correspondence was published by Eben Edwards Beardsley, D.D. (Boston 1881).

SEA'BURY, SAMUEL, D.D.: Protestant Episcopal clergyman and a teacher, editor, and author: 1801, June 9—1872, Oct. 10; b. New London, Conn.; grandson of Bishop Samuel Seabury. He was educated by private tutors, and ordained 1826. He was professor of languages in Flushing Institute and St. Paul's College; editor of *The Churchman* 1834-49; rector of the Church of the Annunciation, New York, 1838-68; and professor of biblical learning in the General Theological Seminary, New York, 1862-72. Among his writings were: *Hist. Sketch of Augustine* (1833); *The Continuity of the Church of England in the 16th Century* (1853); *The Supremacy and Obligation of Conscience* (1860); *Mary the Virgin* (1868); *Theory and Use of the Christian Calendar* (1872); and a work in defense of American slavery 1861. —His son, WILLIAM JONES SEABURY, b. 1837, succeeded his father in the Church of the Annunciation, was chosen professor of ecclesiastical polity in the General Theological Seminary, and has published *Discourses on the Nature and Work of the Holy Spirit* (1874).

SEA BUCKTHORN, or SALLOW-THORN: a monotypic genus (*Hippophaë*) of the *Thymelæinæ,* confined to temperate Europe and Asia, and living near sea-coasts and alpine rivers. The single species, *H. rhamnoides,* is a thorny shrub, sometimes cultivated, especially for hedges near the sea, where it grows luxuriantly, preferring a sandy soil. The leaves are linear lanceolate, silvery in color; the flowers diœcious, with a tubular perianth that in maturity becomes succulent and encloses the seed, thus forming an orange-colored fruit which is agreeably acid. These berries are very abundant and are used for making fish-sauces, jellies and other condiments.

SEA-COOT: a gunners' name for certain dark-colored ducks, especially the American scoter.

SEA-COW: a name often applied generally to sirenians, but especially restricted to the species formerly inhabiting the Pacific coast of Kamchatka—Steller's sea-cow (*Rhytina stelleri*), now extinct. Structurally it differs from other sirenians in the total absence of teeth, the masticating surfaces of the jaws being merely horny pads, very dense and hard. The tail was lobed and the fore limbs small truncate paddles. This was a very large animal, attaining a length of 25 feet and being very bulky. It is now entirely extinct and was under the observation of white men for a bare quarter of a century. In 1741 the explorer Bering and the naturalist Steller discovered this great animal about the shores of two small islands, now known as Bering and Copper islands, in the extreme north Pacific Ocean. It is not known to have lived elsewhere and there is no proof that any examples have been seen since that killed in 1768.

Steller has preserved an account of their habits and anatomy during the period when he was a shipwrecked resident of that inhospitable region. The animals were at that time very abundant in the shallow waters about the islands, where they fed upon the large sea-weeds which grow there so plentifully. They were extremely sluggish and inactive and of an unsuspicious, affectionate disposition. Upon Steller's return to Germany his discovery and suggestion that the flesh of these great sea-cows be utilized by explorers were published. Russian traders and trappers visited the islands in large numbers, and in the short space of time noted exterminated this interesting animal.

SEA' GRAPE (*Ephedra*): genus of plants of nat. order *Gnetaceæ:* the order consists of a small number of species, closely allied in botanical characters to the *Coniferæ,* and by many botanists united with that order, though differing much in appearance. The *Gnetaceæ* are small trees, or twiggy shrubs, with opposite or clustered branches and jointed stems, whence they are sometimes called JOINT-FIRS. They secrete not resinous but watery matter. The development of the ovule is very peculiar; it has a projecting process formed from the intimate covering of the nucleus.

SEA-HARES: a genus (*Aplysia*) of opistho-branchiate gastropod mollusks, in which the shell is either absent or very rudimentary, and is concealed by the mantle. These animals are slug-like in appearance, and derive their popular name from the prominent character of the front pair of tentacles which somewhat resemble the ears of a hare. The side lobes of the mantle are used as fins, and are reflected over the sides and back of the sea-hares, these portions of the mantle thus concealing the shell. This latter structure, when developed, is of oblong, flexible, and transparent character. The gills are placed in the center, and at the posterior portion of the dorsal surface or back; and four tentacles exist. Eyes are present, and are situated at the base of the hinder tentacles. The sea-hares were notorious among the ancients for their supposed venomous properties, and formed ingredients in the poisonous compounds used of old to destroy enemies. Locusta is thus said to have used them against the enemies of Nero; and they formed ingredients in the draught prepared for the tyrant himself. Domitian was similarly suspected of administering the poisonous Aplysiadæ to his brother Titus. And when Apuleius was accused of practising magic a chief proof against him was the fact that he had employed fishermen to obtain sea-hares for him. These animals, however, are harmless so far as poisonous properties are concerned, except that some species exude an acrid liquor irritating to the human skin. The 'lernæa' (*Aplysia leporina*) of the Bay of Naples has an evil reputation among fishermen for causing pain and sickness when touched. The sea-hares also

emit a fluid of a rich purple hue, which, like the ink of the cuttle-fishes, has the property of diffusing itself quickly throughout the surrounding water.

SEA-HORSE: a small fish of the genus *Hippocampus*, in which the head bears a close resemblance to that of the knight in chess. They belong to the order *Lophobranchii* and the same family (*Syngnathidæ*) as the pipe-fishes. From the latter, and indeed from all other fishes, they differ in having a prehensile tail, which is long, tapering, and quadrate in section, owing to the integument of angulated, bony plates, and lacks altogether the caudal fin. The body is compressed, curiously prominent below, protected by rings of spinous bony plates, and bears small pectoral, dorsal and anal fins. In addition to its form the head is remarkable in being supported at right angles to the body-axis on a neck-like construction. Like other parts it is protected by tuberculated or spiny bony plates. A prolonged snout bears the small toothless mouth at its end. The gills are tufted and their arches and covers poorly developed. About half-a-dozen closely similar species are found in our waters, the best known of which is *H. hudsonicus*, found in shallow bays and estuaries along the Atlantic coast as far north as Cape Cod. There is no more interesting inmate of the marine aquarium than the sea-horse, which twists its tail about the stems of sea-plants, among which it seeks concealment or swims slowly in a very unfishlike attitude, with coiled tail, upright in the water. As in the pipe-fishes the eggs are protected until hatched in a brood-pouch at the base of the tail of the male.

In symbolic and heraldic art a 'sea-horse' appears as a fabulous marine animal with foreparts like those of a horse, and with hinder parts like a fish. Neptune is depicted as using them to draw his chariot. In the sea-horse of heraldry, a scalloped fin runs down the back. In biblical literature and early books generally the term often refers uncertainly to the walrus or to the hippopotamus.

SEA ISLANDS: the islands off the coast of South Carolina, south of Winyah Bay. They are a chain of low, flat islands noted for their fertility. The principal islands are Hilton Head, Port Royal, Saint Helena, Edisto, Johns, and James. The quality of the long fibered 'Sea Island cotton' is famous, and the rice product is large. In 1893 and in 1894 a hurricane visited several of the islands, inundating them with the waves of the sea, and destroying the crops.

SEA-KALE: a cruciferous, large-leaved perennial (*Crambe maritima*) indigenous to the coasts of Europe. It has glaucous cabbage-like foliage, and clusters of showy white flowers, and is cultivated in rich soil for the young shoots and unfolded leaves, which are blanched and eaten as spring vegetables, like asparagus.

SEAL, n. *sēl* [OF. *seel*, a seal—from L. *sigillum*, a seal—from *signum*, a mark: It. *sigillo;* Ger. *siegel;* Sp. *sello*, a signet, a seal]: engraved or inscribed piece of metal, precious stone, pebble, or piece of metal, on which some image or device is engraved, used for impressing the wax that closes a letter, or that which is attached to a deed or other parchment or writing (see below): the wax or other substance sealing a deed or making fast a letter (see SEALING-WAX): that which ratifies or confirms; act of confirmation; that which shuts or makes fast: V. to fasten with a seal; to set or affix a seal to; to ratify; to make fast; to authenticate with a stamp; to inclose, hide, or conceal; to imprint on the mind. SEAL'ING, imp. SEALED, pp. *sēld*. ADJ. fastened or furnished with a seal; confirmed. SEAL'ER, n. *-ėr*, one who seals; officer in chancery who seals writs and instruments; in the *United States*, inspector of weights and measures, also of leather. SEAL-ENGRAVING, art of engraving precious stones for seals. GREAT SEAL, the state seal of a nation: in the United Kingdom, impressions from the great seal must be attached to royal charters, grants of land, commissions, etc., to render them valid—this is called 'passing the great seal' (see GREAT SEAL) PRIVY SEAL, personal seal of the sovereign, used in Britain in rendering legal certain instruments of minor importance (see PRIVY SEAL). *Note.*—The *state seals* in Britain are (1) the 'Signet,' which contains the royal arms and supporters, (2) one of a smaller size having an escutcheon of the king's arms only; and (3) a still smaller called the 'cachet,' similarly engraved, and used only for sealing the sovereign's letters to other sovereigns.—For Govt. Seal in the United States, see below.

SEAL: impression on wax or other soft substance, made from a die or matrix of metal, a gem, or other material. The stamp which yields the impression is also called the seal. In Egypt, seals were in use at an early period, the matrix generally forming part of a ring (see GEM: RING). Devices of a variety of sorts were in use at Rome, by the earlier emperors and private individuals. The emperors, after Constantine, introduced *bullæ* or leaden seals; and their use was continued after the fall of the Western Empire by the popes, who attached them to documents by cords or bands. On the earlier papal seals are monograms of the pope; afterward the great seal contained the name of the pope in full, and a cross between the heads of St. Peter and St. Paul, while the papal privy seal, impressed not on lead but on wax, known as the *Seal of the Fisherman*, represented St. Peter fishing. In the 9th and 10th c. we find Charlemagne, the Byzantine emperors, and the Venetian doges, occasionally sealing with gold; and we have an instance as late as the 16th c. of a gold seal appended to the treaty of the Field of the Cloth of Gold, between Henry VIII. and Francis I.

Seals were not much used in England till after the Norman conquest. On the royal great seals was the king in armor on a caparisoned horse galloping, his arms

being shown on his shield after the period when arms came into use; and the reverse represented the king seated on a throne. The great seals of Scotland begin with Duncan II., in the end of the 11th c. In both countries there were also the privy seals with the royal arms only.

Great Seal of William the Conqueror.

Ecclesiastical seals appear first in the 9th c., and attained great beauty in the 13th and 14th. They are of the pointed oval form known as *Vesica piscis:* and have

for subjects a figure of the bishop, sometimes of the Trinity, the Virgin, or a patron saint, seated under an elaborate architectural canopy. The arms of the bishop are often added.

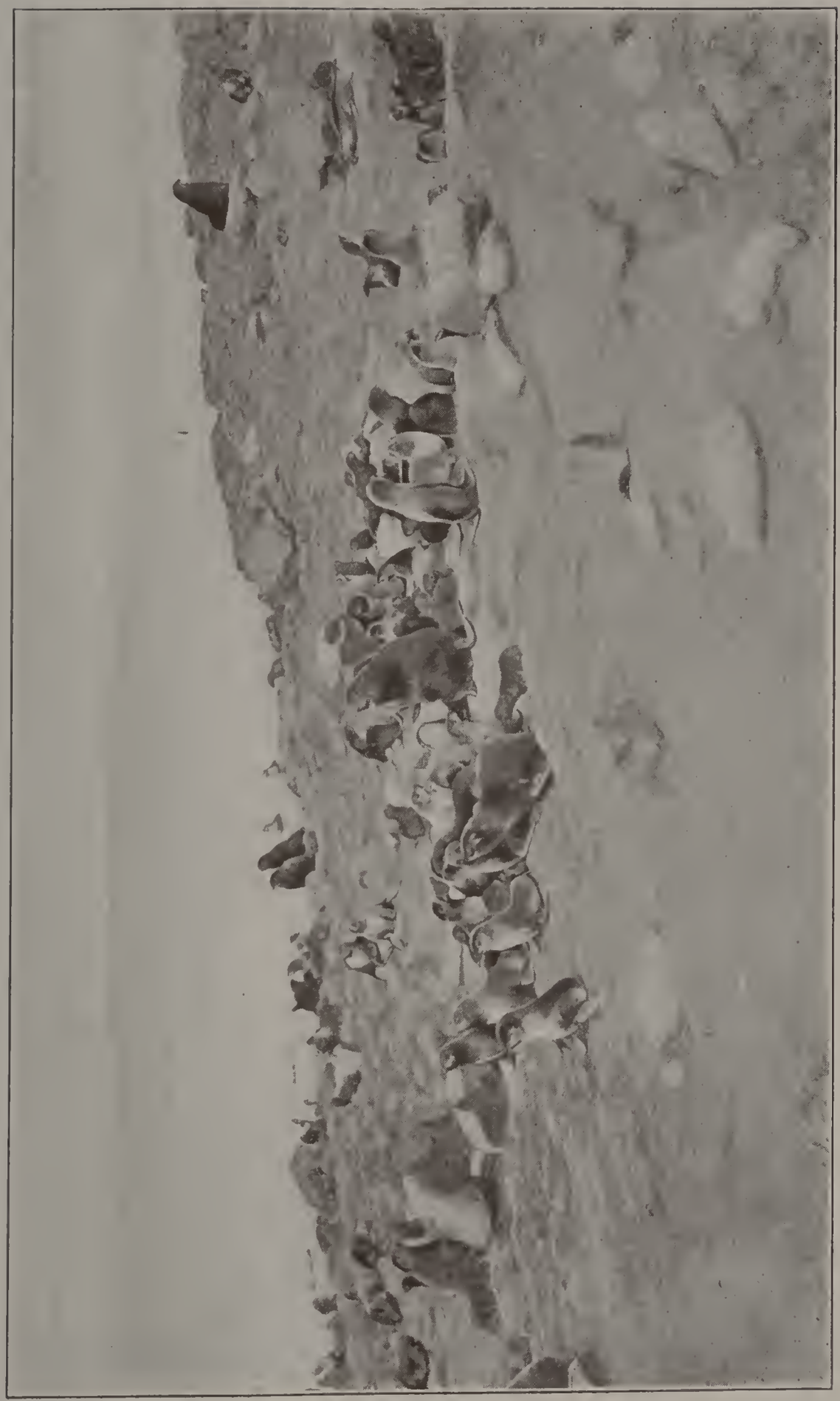
Under the Norman monarchs of England, sealing became a legal formality, necessary to authentication of a deed; and from the 13th c. the seals of all persons of noble or gentle birth represented their armorial ensigns. The seal was generally appended to the document by passing a strip of parchment or a cord through a slit in its lower edge; and the ends being held together, the wax was pressed or molded round them a short distance from the extremity, and the matrix impressed on it. Occasionally the seal was not pendant, but the wax was spread on the deed. The colored wax with the impression was sometimes imbedded in a mass of white wax forming a protective border to it. In England, a seal is still essential to all legal instruments by which real estate is conveyed; but since subscription also has become necessary, the practice of sealing has degenerated into a mere formality. The custom was gradually introduced of covering the wax with white paper, on which the impression was made, and latterly wafers have been considered a sufficient substitute for seals.

The use of corporate seals by towns and boroughs dates as far back as the 12th c. The earlier corporate seals bear the town gates, city walls, or some similar device; the use of corporate arms did not begin till the latter half of the 14th century.

The use of seals in closing letters has of late years been almost displaced by that of adhesive envelopes; though seals are still used in ceremonious letters.—For their governmental use, see GREAT SEAL: PRIVY SEAL: see also below.

In the states of the American Union the device of a seal, as of a public officer, e.g., a notary, or of a corporation, may be impressed on the paper of the instrument; usually the seal of a public officer consists of a disk of paper bearing the device of the seal attached to the instrument. The seal of a private individual may be a disk of paper, or even a mere scroll or flourish near his signature, and between the letters L. S., i.e., *locus sigilli* (place of the seal).

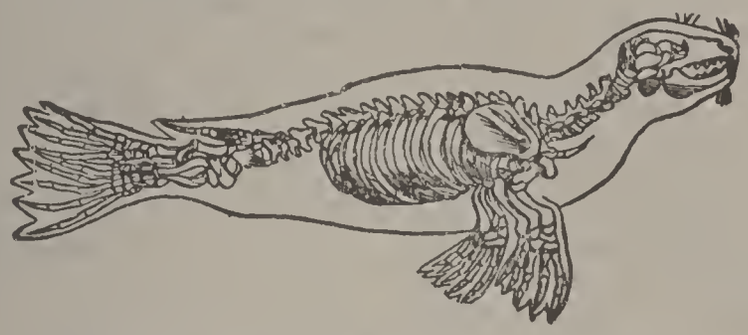
Seal of the United States.—The following was adopted 1782, June 20: ARMS, paleways of 13 pieces argent and gules; a chief azure; the escutcheon on the breast of the American eagle displayer proper, holding in his dexter talon an olive-branch, and in his sinister a bundle of 13 arrows, all proper, and in his beak a scroll, inscribed with this motto, '*E pluribus unum.*' For the CREST: over the head of the eagle which appears above the escutcheon, a glory, or breaking through a cloud, proper, and surrounding 13 stars, forming a constellation argent on an azure field. REVERSE. a pyramid unfinished. In the zenith, an eye in a triangle, surrounded with a glory proper: over the eye, these words, '*Annuit cœptis.*' On the base of the



HERD OF SEALS, GORBATCH ROOKERY, PRIBILOF ISLAND, ALASKA.

pyramid, the numerical letters MDCCLXXVI, and underneath, the following motto: *Novus ordo sectorum.*'—The sec. of state is custodian of the great seal of the United States, and affixes it to all executive proclamations, to various commissions, and to warrants for pardon and the extradition of fugitive criminals.

SEAL, n. *sēl* [Icel. *selr;* Dan. *sæl,* a seal]: marine amphibious mammal of various species, chiefly inhabiting the sea-coasts of the higher latitudes, much sought after for its skin and oil; the sea-calf; the sea-dog. SEAL'ING, n. the pursuit of seals for their skin and oil.—The *Seal* (*Phoca*) is a carnivorous mammal, type of the family *Phocidæ.* The old Linnæan genus *Phoca* included the Morse (q.v.) or Walrus. The *Phocidæ* or seals proper, the *Otariidæ* (see OTARY), and the walrus; constitute the section *Pinnigrada* or *Pinnipedia* of the order *Carnivora* (q.v.).



Skeleton of Seal, with Outline of the Figure.

Their structure is perfectly adapted to an aquatic life, and they live chiefly in water, but spend part of their time on shore, reposing and basking in the sunshine on rocks, sand-banks, ice-fields, or beaches; and they bring forth their young on shore. The body is elongated, and tapers from the chest to the tail; the head somewhat resembles that of a dog, and in most of the species the brain is large; the feet are short, and little more than the paw projects beyond the skin of the body; all the feet are thoroughly webbed, and five-toed; the fore-feet are placed like those of other quadrupeds; but the hind-feet are directed backward, like a prolongation of the body, and between them is a short tail. The toes, particularly of the hind-feet, are capable of being spread out very widely in swimming, so as to give great propulsive power. The movements of seals in the water are very rapid and graceful; on land, they are very peculiar; even the fore-feet being little used or not at all, but the body contracted by an upward bending of the spine, and so thrown forward by a succession of jerks; in which way, however, a S can escape from all but fleet assailants. The flexibility of the spine is very remarkable, and depends on the very large intervertebral cartilages formed of fibrous concentric rings. The muscles, which are connected with the spine on all sides are of great strength.

The teeth differ considerably in the different genera, but in all are adapted for seizure of slippery prey, the

chief food of seals being fishes, though they do not reject other animal food, and are said even to feed in part on vegetable substances. Their incisors are either six in the upper jaw and four in the lower, or four in the upper and two in the lower; they all have large and strong canine teeth; and the molars, usually five or six on each side in each jaw, are either sharp-edged or conical, and beset with points. Seals have a remarkable habit of swallowing large stones, for which no probable reason has been conjectured. Their stomachs are often found in part filled with stones. The stomach is quite simple; the gullet (*æsophagus*) enters it at the left extremity; the cæcum is short, the intestinal canal long.

The respiration of seals is extremely slow, about two minutes intervening between one breath and another, when the animal is on land and in full activity. A S. has been known to remain 25 minutes under water. Their slowness of respiration and power of suspending it for a considerable time enable them to pursue their prey under water. The fur is very smooth, and abundantly lubricated with an oily secretion. There is generally an inner coating of rich fur, through which grow long hairs, forming an outer covering. Another adaptation to aquatic life and cold climates appears in a layer of fat immediately under the skin—from which *Seal Oil* is obtained—serving not only for support when food is scarce, but for protection from cold, and at the same time rendering the whole body lighter. The nostrils are capable of being readily and completely closed, and are so while the S. is under water; and there is a similar provision for the ears; while the eye, which is large, exhibits remarkable peculiarities, supposed to be intended for its adaptation for use in both air and water. The face is provided with strong whiskers, connected at their base with large nerves.

Seals produce young only once a year; sometimes one, sometimes two, at a birth. Not long after their birth, the young are conducted by the mother into the sea. Many, if not all, of the species are polygamous. Fierce fights occur among the males.

Seals are on their guard against the approach of man, where they have been much molested; but where they have not been attacked, they are far from shy, and approach very close to boats, or to men on shore, as if animated by curiosity. They are much affected by musical sounds. A flute is said to attract seals to a boat, where they have not learned caution from sore experience; and the ringing of the church bell at Hoy, in Orkney, has very often caused the appearance of numerous seals in the little bay. Seals possess all the five senses in great perfection.

The Common S. and some of the other species are very intelligent; but there is considerable difference in this respect among the species. The Common S. and some others have often been tamed, and are capable of living long in domestication, if freely supplied with water. They become very familiar with those who attend to them; are very fond of caresses and of notice; recognize their name like

dogs, and readily learn many little tricks, of which advantage has been taken for exhibitions.

Seals are found in all colder parts of the world, most abundantly in the arctic and antarctic regions; some also in temperate climates, as far s. as the Mediterranean, and as far n. as the La Plata. Some of them ascend rivers to some distance in pursuit of salmon and other fish. They are found in the Caspian Sea, and even in the fresh-water Lake Baikal.

The species are numerous, but in no group of Mammalia does more remain for further investigation. Seals are divided into two principal groups—*Seals*, strictly so called, and *Otaries* (see OTARY); the former distinguished by the complete lack of external ears, which the latter possess, and by their dentition. The true seals have been further subdivided into genera, characterized chiefly by their dentition. In the restricted genus *Phoca*, or *Calocephalus*, the incisors are pointed and sharp-edged, six above and four below. The Common or Harbor S. (*Phoca vitulina*) is found on both coasts of the Atlantic, and as far s. as New York; and in the Arctic Ocean. It is common on the wilder and more unfrequented parts of the Brit. coast, particularly in the north. It is remarkably distinguished, even among its nearest congeners, by the oblique position of the molar teeth. The fur is yellowish, variously spotted, and marked with brown. The whole length is 3 to 5 ft. Its delight in

Common Seal (*P. vitulina*), attitude when swimming.

salmon as food is so great that it has been known to haunt the neighborhood of a salmon-net for a long time, and to take the fish after they were entrapped in it. The Common S. is seen usually in small herds. Its skin and oil are of considerable mercantile importance. The skin is dressed with the fur on, to make caps, etc., or is tanned and used as leather. The oil, when made before decay has begun, is colorless and nearly inodorous; it is much superior to whale-oil. The flesh is much used for food in far northern countries, as is that of all the other species which those regions produce. It is not easy to shoot a seal. While flint-locks were in use, the S. always dived so quickly on seeing the flash as usually to escape the ball. The popular name SEA-CALF, and the specific name *vitulina*, have

reference to a supposed resemblance of the voice to that of a calf.—The HARP S. (*P. Grœnlandicus*) receives its popu-

Harp Seal (*Phoca Grœnlandicus*), attitude on land.

lar name from a large, black, crescent-shaped mark on each side of the back. It belongs chiefly to northern regions. It is 6 to 8 or even 9 ft. in length.—The GREAT S., or BEARDED S. (*Erignathus barbatus*), plentiful on the coasts of Greenland, is generally 9 or 10 ft. long, sometimes more. —The ROUGH or BRISTLED S. (*P. hispida*) frequents quiet bays on the coasts of Greenland, where many thousands are annually killed for their skins and oil. It is the smallest of the northern species.—The GRAY S. (*Halichœrus gryphus*), has a very flat head, and attains great size.—The CRESTED S., or HOODED S. (*Crystophora cristata*) is remarkable for elevation of the septum of the nose of the adult male into a crest, which supports a hood covering

Hooded or Crested Seal.

the head, and capable of being distended and elevated or depressed at pleasure: the use of this appendage is not known. This S. is plentiful on the coasts of Greenland and n. parts of N. America.—The seals of the southern seas are quite distinct from those of the northern. SEA LEOPARD, or LEOPARD S., is a name applied to several spotted species. By far the largest of all the seals is the ELEPHANT S., or Sea Elephant of the southern seas (*Macrorhinus proboscideus*), which, with the Crested S., belongs to the sub-family *Cystophorinæ*. The others above mentioned are of the sub-

family *Phocinæ*. The *Otariidæ*, or Eared Seals, include the sea-bears, of which the *Callorhinus ursinus* is the most important in the fur-trade, the smaller fur seals of the s. Pacific being of the genus *Arctocephalus* (see OTARY). In this family are the sea-lions, of a number of genera, chiefly of the Pacific. *Eumetopias Stelleri*, of the n. Pacific, is the largest, 11-13 ft., and attaining 1,200 lbs. The sea-lion of the rocks near San Francisco is *Zalophus Californicus*, ranging from California to Japan. The Eared Seals have longer fore-limbs, with more power of assuming a semi-erect posture. Seals are to some extent migratory, though their migrations do not extend to very great distances and are probably regulated by the abundance or scarcity of food. The time of the return of certain species to certain coasts is confidently reckoned on by the natives of the north and by seal-hunters.

SEA LAVENDER: a name common to various species of *Statice*, and to the closely allied *Limonium carolinianum*, a North American sea-coast plant. The latter has very long, thick rootstocks, which are employed as an astringent drug; tufts of radical, oblanceolate, fleshy leaves, and wide-spreading panicles of 5-merous, lavender-lined tiny flowers, standing erect. This sea-lavender, or marsh rosemary, as it is also called, often grows over such large areas that the marshes seem covered with low hanging blue mist. The flower panicles, when dried, are often used as winter ornaments, since they keep their form and color. It is called marsh-beet in England from its purplish root, and was the red behen of early druggists.

SEA-LEMON: a shell-less mollusk of the nudibranch family *Doridæ*, of cosmopolitan range. The body somewhat resembles a lemon in color, showing a beautiful plume-like tuft of gills (when expanded) on the back. These mollusks are carnivorous, feeding on zoophytes, crustacea, etc., and live under stones on the beach, usually near low-water mark. The eggs are emitted embedded in broad gelatinous ribbon-like masses, which may be found attached to the fronds of seaweeds. These 'spawn-coils,' as they are named, include immense numbers of eggs. Darwin estimated that upward of 600,000 ova were contained in a coil found at the Falkland Islands.

SEA-LETTUCE: the delicate, thin, waving fronds of *Ulva lactuca*, a pale green sea-weed.

SEA-LILY: a crinoid, especially a living example, as *Pentacrinus;* fossil crinoids are often called stone-lilies.

SEALING, or SEAL-FISHERY: the occupation of hunting seals. Nearly all of the seals, if not all, are gregarious, and one seems to be always placed on the watch, where danger is apprehended from bears or from hunters. They climb up through holes in the ice-fields of the polar seas, even when there is a height of several feet from

the water, but it is difficult for the hunter to place himself between them and the hole. Seal-hunting is not free from danger, an enraged seal being a formidable antagonist, at least to the inexperienced.

The hunting of seals of the family *Phocidæ* ('hair seals') is carried on in Newfoundland, Labrador, Nova Zembla, the Arctic Ocean, the north and south Pacific, etc. The fur seal (*Otariidæ* family) is not found in the north Atlantic, but occurs in both the Atlantic and Pacific from the tropics to the Antarctic ice-field, and in the north Pacific; its favorite haunts are in Behring Sea. The Pribylov Islands, owned by the United States, are resorted to in the breeding season by the fur seal in enormous numbers, and the exclusive right of the 'fishery' on these islands is farmed out by the government to the Alaska Commercial Company. The claim of jurisdiction in Behring Sea, so far at least as involves protection of the seals from destruction by untimely or excessive pursuit, has been made by the United States, including the right under certain circumstances to exclude from the fisheries, whether on the islands or in the sea, the sealers of other nations. Great Britain has maintained that Behring Sea is an 'open' sea in the sense that the ships and subjects of all nations have equal rights which preclude the right of search and capture of foreign vessels by United States cruisers. The two nations concluded an agreement (1891, June 15) for one year to prevent the capture of seals by the citizens of either country in Behring Sea or on the islands, except that the Alaska Commercial Company was to be permitted to take 7,500 seals for the sustenation of the natives. In the meantime the representatives of England and the United States would investigate the whole case, and confer with a view to terminating the controversy. But, 1892, June, 25, British sealing schooners were seized by the United States for violating revenue laws, and in Aug. sealers from British Columbia were also seized by Russia, whose government claimed jurisdiction over 1,000 m. in Behring Sea despite the fact that the United States by the purchase of Alaska had laid claim to this right. To end the controversy the United States signed a treaty with Great Britain (1892, Feb., ratified May 7) providing for settlement of the dispute by arbitration. The court of arbitrators met at Paris 1893 (Feb.), began its deliberations Apr. 4, and delivered its decision Aug. 15. The decision on the legal questions involved was adverse to the contention of the United States, and as provided in this event, a set of regulations was formulated for the protection of the herd, to be enforced jointly by the two nations. These regulations provided, after the analogy of game laws, for a closed season in May, June and July, when all sealing should be suspended, and for a closed zone of 60 m. radius about the islands, within which no sealing whatever should be allowed. The closed season covered the breeding period. The protected zone

was supposed to provide a safe feeding ground for the mother seal while her young was dependent upon her. The regulations, however, failed of their object because the mother seal does not feed within the protected area, but far outside of it. She was, therefore, taken by the pelagic sealer as before, and her young was left to starve. The largest catch in the history of pelagic sealing, that of 1894, was made in the first season of the operation of the very regulations designed to so limit and restrict pelagic sealing as to protect and preserve the herd.

The question of damages was decided adversely to the United States, but the amount to be paid to Great Britain was left for further diplomatic action. A treaty between the United States and Great Britain for appointment of a commission to assess damages was ratified by the United States senate 1896, Apr. 15, and two United States commissioners were appointed in July. In Nov. the commission began its deliberations at Victoria, B. C.

In 1897, Nov., the United States signed treaties with Russia and Japan for protection of seals, to continue in force for one year. Later, negotiations between Great Britain, Canada, and the United States for a conference looking toward protecting the seals from extermination, were opened (Nov. 10) in Washington, D. C. The United States was represented by Charles S. Hamlin, John W. Foster, and Prof. David S. Jordan, and while the British interests were intrusted to Sir Julian Pauncefote and Prof. Thompson, those of the Canadian dominion were in the care of Sir Wilfrid Laurier, Sir Louis Davies, and Prof. Macoun.

After a full discussion of the results of their labors, the commission reached an agreement on all essential facts, establishing the fact of decline, its probable rate and its cause. The cause was fixed as the killing of females at sea involved in pelagic sealing and the agreement foreshadowed—the commission having no power to consider ways and means—the abolition of pelagic sealing as the only means of saving the herd.

On Jan. 14, 1898, the report and awards of the commission were presented to congress. The principal of the claims allowed to the owners of the vessels amounted to $264,188.91, with accrued interest of $413,979.27. The difference between this and $415,157.26 was for personal claims. The bill passed to the house June 13, the senate June 14, and was properly approved by Pres. McKinley. The money was paid to the British ambassador June 16. In 1898 there was established an international commission to settle all questions at issue between the United States and Canada, including the North American fishing question. This Joint High Commission met at Quebec. Unable to reach an agreement on the boundary dispute, this commission suspended action without result, and its labors have never been resumed. Meanwhile pelagic sealing has continued and the herd has steadily declined.

SEAL'ING-WAX: composition of hard resinous materials used for receiving and retaining the impressions of seals. Common bees-wax was first used in Europe generally, being mixed with earthy materials to give it consistency; but its preservation was difficult, as a very little heat softened it. The Venetians brought the Indian sealing-wax to Europe, and the Spaniards received it from the Venetians and made it an important article of commerce. The Indian wax was made only of shell-lac, colored with vermilion or some other pigment; and this has held its place as superior to all other materials. In the European manufacture there is added a portion of Venetian turpentine (see TURPENTINE) and of resin.

SEAL ISLANDS, or LOBOS ISLANDS, *lō'bŏs:* see PERU.

SEALKOTE, *sē-âl-kōt'*, or SIALKOT: town in the Punjab, cap. of the dist. of S.; near the left bank of the Chenab, 65 m. n.n.e. from Lahore. It has manufactories of paper; and is a handsome and well-built city. Pop. (1881) 39,613; (1891) 54,930; (1901) 57,956.

SEAL OF CONFESSION: see CONFESSION, in Theology: CONFIDENTIALITY.

SEAM, n. *sēm* [Icel. *saumr;* Dan. and Sw. *sŏm*, a sewing, a seam: Dut. *zoom*, a hem: Ger. *saum*, a hem or seam]: the uniting or joining together of two pieces of cloth by sewing or stitching them with thread; the line where this junction is made; the line or space between planks when placed or fastened together; a scar; a vein or stratum of an ore, or of coal, etc.; in *geol.*, a thin layer between thicker strata: V. to unite by sewing with thread; to scar. SEAM'ING, imp. SEAMED, pp. *sēmd.* SEAM'LESS, a. *-lĕs*, woven throughout, and nowhere united by a seam. SEAM'STRESS, n. *-strĕs*, a woman whose occupation is sewing; but the common spelling is now SEMPSTRESS, which see. SEAMY, a. *sēm'ĭ*, having a seam; showing the seam.

SEAM, n. *sēm* [AS. *seam;* Ger. *saum*, a load or burden: OF. *somme*, a load—from mid. L. *alma;* L. *sagma*, a pack—from Gr. *sagma*, a pack-saddle]: a measure or quantity; a *seam* of grain, 8 bushels; a *seam* of glass, 120 pounds.

SEAM, n. *sēm* [F. *sain*, the fat or grease of a hog—from L. *sagīna*, fatness produced by feeding: Sp. *sain;* It. *saime*, grease or fat]: in *OE.*, tallow; grease; fat.

SEAMAN, SEAMANSHIP: see under SEA.

SEA'MEN: technically, persons below the rank of officer, employed in navigating decked vessels on the high seas—men working on lakes and rivers being usually styled 'watermen.' Two opposite conditions are essential to the well-being of the vessel—first, the absolute subordination and perfect obedience of the crew to the master; secondly, their protection against tyranny or caprice on his part. For this purpose the law of modern civilized states is minute in the rules for both masters and seamen.

The U. S. statutes require that the master of a vessel and his seamen shall sign 'shipping articles' setting forth the voyage or voyages and the period of time for which the

mariners are engaged. A penalty is imposed when seamen are shipped without such articles. The seaman must perform the voyage, and cannot elect to pay damages for non-performance. He must not quit the ship without leave, and for every absence of 48 hours or less forfeits 3 days' pay: when absent for more than 48 hours without leave, he forfeits all wages due him and whatever goods he may have on the ship; and may be imprisoned till the ship is ready to sail. On board, he may be imprisoned for disobedience, insolence, etc. A seaman left destitute in a foreign port, on application to an American consul, must be sent back to the United States at public cost.—See NAVIGATION LAWS.

SEA'-MOUSE (*Aphrodite*): genus of dorsibranchiate annelida, of family *Aphroditidæ*, to all of which the popular

Sea-mouse (*Aphrodite aculeata*).

name is extended. They are readily distinguished by two longitudinal ranges of broad membranous scales covering the back, under which are the gills in the form of little fleshy crests. The scales move up and down as the animal respires; and are concealed by a substance resembling tow or felt, which permits access of water but excludes mud and sand. The head is furnished with tentacles; some have two eyes and some four. The body is edged with spines. Besides all this, its sides are covered with flexible bristles or silky hairs, which give to these creatures a wonderful beauty of color, unsurpassed by that of humming-birds or the most brilliant gems. Each hair, even when viewed singly, and moved about in the sunshine, reflects all the hues of the rainbow. Yet sea-mice are usually concealed under stones, and dwell among the mud at the bottom of the sea. Storms frequently throw them on the beach in great numbers. The Common S.-M. is a very beautiful species, *A. aculeata*, of oval form, 6 or 8 inches long, and 2 or 3 broad.

SEAN, n. *sēn*, a net: see SEINE.

SÉANCE, n. *sā-ängs'* [F. *séance*, a seat, sitting—from L. *sedens* or *seden'tem*, sitting; *sedĕrĕ*, to sit]: session, as of some public body; a sitting of any kind for consideration or inquiry; select scientific meeting; a spiritualistic meeting.

SEANNACHIE, or SENNACHIE, n. *sĕn'ă-chē* [Gael. *seannachaidh*, a bard—from *sean*, old]: in *Scot.*, a Highland bard or a genealogist.

SEA-OTTER: a fur-bearing animal (*Latax lutris*) of the weasel family (*Mustelidæ*), and in its webbed hind feet and aquatic habits resembling the true otter, with which it is united zoologically in the subfamily *Lutrinæ*. The sea-otter is of a robust build, about four feet long, with a short, blunt tail, short limbs, small fore feet and large, fully-webbed hind feet. The ears are small and the broad muzzle bears spreading tufts of stout bristles. There are but two incisor teeth on each side of the lower jaw and the molar and premolar teeth are remarkable for their massiveness and the bluntness of the cusps. The inner fur, which is very soft, dense and woolly, is deep brown or, in old animals, black, the longer white-tipped hairs being scanty on the body, to which they impart a hoary aspect, but more abundant on the yellowish or grayish head and neck. Sea-otters were formerly very abundant on rocky shores and islands of the North Pacific on both the American and Asiatic sides. The natives of the Aleutian islands clothed themselves in their skins, but with the increased demand for the fur in China, Europe and America, and especially among the Russian nobility, their unremitting pursuit by native and white hunters has rendered them one of the rarest and most valued of fur-bearing animals. In greatly reduced numbers they are still found in Alaska and within the United States on a very limited reach of the Oregon coast. The otters are now found especially on the island-like masses of the giant bladder kelp or sea-weed and much persecution has made them exceedingly shy and wary. They are strictly marine and never leave the vicinity of water. Their food consists of various kinds of crustacea, mollusks and sea-urchins, which are easily crushed between the blunt massive teeth which are not at all adapted to a fish diet. A single young is born at a time and at any season, and is nursed by the mother as she lies on her back in the water. A century ago a single trading company secured as many as 15,000 skins valued at $1,000,000 in one year, but now the annual production of all the hunters would not exceed 5,000, and single skins are worth $150 to the hunter and $1,000 or more at the final market. Formerly they were taken in nets, or shot, speared and clubbed; but now are usually shot.

SEA-PEN: an alcyonarian coral of the family *Pennatulidæ* (class *Actinozoa*). It is a compound organism, which consists of a main stem with lateral pinnæ or branches, forming a feather-shaped community. The lower end of the stem is fleshy, destitute of polyps, and contains an internal coral-rod, by which the sea-pens attach themselves loosely to the mud of the sea-bed. In color they are reddish-purple, the lower extremity being of a bright orange hue. The branches are studded on their upper margins with the individual polyp, which are connected together through the fleshy medium or cœnosarc. These organisms are common in all the warm seas.

SEA-PIKE (*Centropomus undecimalis*): fish which, notwithstanding its popular name, belongs to the perch family: its form, however, is elongated like the pike. The body is compressed; there are two dorsal fins; the mouth is not very large; and the teeth are numerous, small, and equal. The color is silvery-white, tinged with green on the back. It is found on the w. coasts of tropical America. It attains a large size, and is a valuable fish.—On the British coasts, the name S.-P. is sometimes given to the Garfish.

SEAR, or SERE, a. *sēr* [Dut. *zoor;* Dan. *saare;* Low Ger. *soor*, dry: AS. *seárian*, to dry up: Gael. *searg*, to dry, to wither]: no longer green; dry; withered—applied to leaves. SEAR, v. to burn to dryness and hardness at the surface; to cauterize; to render callous or insensible; to brand. SEAR'ING, imp. SEARED, pp. *sērd:* ADJ. burned on the surface; hardened. SEAREDNESS, n. *sēr'ĕd-nĕs*, the state of being seared. SEAR LEAVES, leaves withered or dead. SEAR WOOD, dead boughs. IN THE SEAR AND YELLOW LEAF ['the sear, the yellow leaf'—*Shakes.*]: that period of life when the body begins to decay. TO SEAR UP, to close by searing or cauterizing.

SEARCE, n. *sĕrs*, or SARCE, n. *sârs* [F. *sasser*, to sift through a fine sieve: F. *sas;* OF. *séas*, a ranging sieve or searce—from L. *sēta*, a bristle, a horse-hair]: in *OE.* and *provincial usage*, a fine sieve; a bolter: V. to separate the fine part from the coarse, as of meal; to bolt; to sift. SEARC'ING, imp. SEARCED, pp. *sĕrst:* ADJ. sifted. SEAR'CER, n. *-sĕr*, one who or that which bolts corn.

SEARCH, n. *sĕrch* [F. *chercher;* Norm. F. *sercher;* It. *cercare*, to search, to seek—from mid. L. *circārĕ*, to wander hither and thither—from L. *circus;* Gr. *kirkos*, a circle]: a seeking or looking, as for something lost or desired, or whose place is unknown; quest; pursuit; inquiry; examination: V. to seek for the purpose of finding; to look through; to try to find out; to make inquiry; to explore; to put to the test; to probe. SEARCH'ING, imp.: ADJ. minute and careful in the way of investigation; close; penetrating; keen: N. examination; inquisition. SEARCHED, pp. *sĕrcht.* SEARCH'ER, n. *-ĕr*, one who or that which searches; an inquirer. SEARCH'ABLE, a. *-ă-bl*, that may be searched or explored. SEARCH'ABLENESS, n. *-nĕs*, state of being searchable. SEARCH'INGLY, ad. *-ĭng-lĭ.* SEARCH'INGNESS, n. *-nĕs*, the quality of being searching. SEARCH'LESS, a. *-lĕs*, that cannot be searched: inscrutable. TO SEARCH OUT, to find by seeking; to seek till found. RIGHT OF SEARCH, in *international law*, the right of a belligerent in time of war to detain private merchant-ships of other nations which he meets on the high seas, to examine and search for enemy's property, or for articles contraband of war (see INTERNATIONAL LAW).—SYN of 'search, n.': examination; scrutiny; inquiry; quest; exploration; investigation; research; pursuit; exploitation; inspection; trial; look.

SEARCH OF INCUMBRANCES: investigation made usually for an intending purchaser or mortgagee to ascertain the history of the fee, also what liens are in existence affecting a piece of real estate which it may be desired to purchase or mortgage. To ascertain the history of the fee, prior conveyances, mortgages, wills, and assignments for the benefit of creditors must be principally resorted to. This portion of the investigation is generally embodied by the examiner in a record by itself and termed an abstract of the title. The liens searched against are usually judgments, which latter are of two principal sorts—namely, state and federal unpaid taxes, and assessments for betterments and improvements; and liens imposed by mechanics, building and material men. So far as the fee is concerned, the time to which the search should go back depends largely on the locality and the chain of title, but usually it is safest to go back as far as existing records permit. So far as liens are concerned, the searcher ought to go back as far as the liens are given vitality by the statutes of the jurisdiction in which the search is being instituted. Searches are made usually by officers designated by law for the purpose, and when so made are known as 'official.' Within the last few years, however, corporations called 'title companies' have sprung up in various large cities, notably New York and Brooklyn, which also undertake the task of making searches, and supply them more cheaply and expeditiously than the county clerks, registers, and court officers to whom the work is by statute committed. In judicial proceedings, however, the 'official' search is the only one recognized by the courts as authoritative.

SEARCH-WARRANT: an authority granted to a constable by a justice of the peace to enter the premises of a person suspected of secreting stolen goods, in order to discover, and to seize the goods if found; and similar warrants are granted to discover property in respect of which other offenses are committed. Before such a warrant can be issued, a credible witness must on oath prove a reasonable cause to suspect that the party proceeded against has the property in his possession or in his premises. The name of the person whose premises are to be searched must be correctly described in the warrant.

SEARING, *sēr'ing*, LAURA CATHERINE WALLER (REDDEN); *'Howard Glyndon'*: author: b. Somerset co., Md., 1840, Feb. 9. When 10 years of age she became deaf, and afterward lost her power of speech. Her parents removed to Mo., and she was educated at the state institution for the deaf and dumb. She commenced writing 1860 for the St. Louis *Republican*, under the name Howard Glyndon, was war correspondent of that paper, studied the modern languages in Europe 1865–68, and was correspondent of the New York *Times*, and 1868–76 was connected with the New York *Mail*. She studied articulation under Alexander Graham Bell and others, and recovered the power of speech. She was married 1876 to Edward W. Searing, and removed to Cal. 1886. Among her works are *Idyls of Battle* (1864), and *Sounds from Secret Chambers* (1874.)

SEARS, *sērz*, BARNAS, D.D., LL.D.: 1802, Nov. 19—1880, July 6; b. Sandisfield, Mass.: Bapt. minister, scholar, and pres. of Brown Univ. He graduated at Brown, and at Newton Theol. Seminary; was a Bapt. pastor in Hartford, and prof. in the literary and theol. institution at Hamilton, N. Y., and later in the Newton (Mass.) Seminary. During an interval of study abroad, he founded Bapt. missions in Germany. In 1848 he became sec. and agent of the Mass. board of education; in 1855 pres. of Brown Univ., resigning 1867 to be gen. agent of the Peabody educational fund, which office he held till his death at Saratoga Springs. His honorary titles, received from Yale and Harvard, were deserved testimonials to his high scholarship and efficient services. For some years he was editor of and contributor to the *Christian Review*. He published an improved ed. of Nohden's Ger. grammar 1842; contributed to *Essays on Classial Literature* (1843); and among his writings are *The Ciceronian, or Prussian Mode of Instruction in Latin* (1844); *Life of Luther* (1850); *Discourse at the Centennial Celebration of Brown University* (1864). He published also *Select Treatises of Martin Luther*, in the original German, and a revised edition of Roget's *Thesaurus of English Words*.

SEARS, EDMUND HAMILTON, D.D.: 1810–1876, Jan. 14; b. Sandisfield, Mass.: pastor and author. He graduated at Union Coll. 1834, and Harvard Divinity School 1837; was Unitarian pastor at Wayland, Mass., 1839–40, and Lancaster, Mass., 1840–47; edited the *Monthly Religious Mag.*, 1847–65; and was pastor at Weston, Mass., 1865, till his death in that place. He received the degree D.D. from Union Coll. 1871. His books had wide circulation among those who appreciate graceful diction, refined thought, and spiritual elevation of feeling, especially *Athanasia* (1860), a Christian contemplation of death; and *Foregleams of Immortality*. Other works were *Regeneration* (1853); *Pictures of the Olden Time* (1857); *Christian Lyrics* (1860); *The Fourth Gospel the Heart of Christ* (1872); and *Sermons and Songs of the Christian Life* (1875).

SEARS, ISAAC: 1729–1786, Oct. 28; b. Norwalk, Conn. He was engaged for three years privateering against the French; but his vessel being wrecked 1761, he settled in New York and engaged in trade with the W. I. and Europe. He strongly opposed the Stamp Act, became one of the leaders of the Sons of Liberty, led the force 1775 which sacked the office and destroyed the presses of the *Royal Gazette* in New York, actively supported the patriot cause during the revolution, and was a member of the N. Y. assembly and of the provincial congress 1783. He lost his fortune during the war, engaged as supercargo on a merchant vessel 1785, and on his first voyage died at Canton, China.

SEA-SERPENT: name given to gigantic animals, presumedly of serpentine form, believed by many naturalists to exist in the sea-depths, especially in tropical oceans. The question of the existence of sea-serpents has long formed one of the problems of zoological science. But there is certainly a reasonable basis for the supposition that undescribed marine forms exist in the sea-depths, and that they occasionally appear on the surface. The account of Capt. M'Quhae, published 1848, is well known. He commanded H.M.S. *Dædalus*, and encountered the serpentine form in lat. 24° 44′ s., long. 9° 20′ e., therefore in the s. Atlantic Ocean, near the Tropic of Capricorn, not very far from the coast of Africa. Capt. M'Quhae, in his Report to the Admiralty, describes it with confidence as 'an enormous serpent, with head and shoulders kept about 4 ft. constantly above the surface of the sea;' and he adds: 'As nearly as we could approximate by comparing it with the length of what our maintopsail-yard would show in the water, there was at the very least 60 ft. of the animal *à fleur d'eau*, no portion of which was, to our perception, used in propelling it through the water, either by vertical or horizontal undulation. It passed rapidly, but so close

Sea-serpent.
(From Pontopiddan.)

under our lee-quarter that had it been a man of my acquaintance, I should have easily recognized his features with the naked eye; and it did not, either in approaching the ship or after it had passed our wake, deviate in the slightest degree from its course to the s.w., which it held on at the pace of from 12 to 15 m. per hour, apparently on some determined purpose. The diameter of the serpent was about 15 or 16 inches behind the head, which was, without any doubt, that of a snake; and it was never, during the twenty minutes that it continued in sight of our glasses, once below the surface of the water; its color a dark-brown, with yellowish-white about the throat. It had no fins, but something like the mane of a horse, or rather a bunch of sea-weed, washed about its back.' Regret has been expressed that Capt. M'Quhae did not bestow a shot on it. Figures prepared from a sketch by him were published in the *Illustrated London News* 1848, Oct. 28. About the same time, the testimony of another witness, Lieut. Drummond, appeared, and was found to

differ in some important points from the account by Capt. M'Quhae, and the figures published with his approbation; particularly in ascribing a more elongated form to the head, in the mention of a back-fin, whereas Capt. M'Quhae expressly says that no fins were seen, and in a lower estimate of the length of the portion of the animal visible. Lieut. Drummond's words are: 'The appearance of its head, which, with the back-fin, was the only portion of the animal visible, was long, pointed, and flattened at the top, perhaps 10 ft. in length; the upper jaw projecting considerably; the fin was, perhaps, 20 ft. in the rear of the head, and visible occasionally; the captain also asserted that he saw the tail, or another fin about the same distance behind it; the upper part of the head and shoulders appeared of a dark brown color, and beneath the under jaw a brownish-white. It pursued a steady and undeviating course, keeping its head horizontal with the water, and in rather a raised position, disappearing occasionally beneath a wave for a very brief interval, and not apparently for the purposes of respiration. It was going at the rate of perhaps from 12 to 14 m. an hour, and when nearest was perhaps 100 yards distant. In fact, it gave one quite the idea of a large snake or eel.' Lieut. Drummond's account is the more worthy of regard as it is derived from his log-book.

In 1875 a battle between a sea-serpent and a whale was viewed from the deck of the ship *Pauline* of London, Capt. Drevar, when proceeding with a cargo of coals from Shields to Zanzibar, destined for her majesty's ship *London*. When the *Pauline* reached the region of the trade-winds and equatorial currents, she was carried out of her course, and after a severe storm found herself off Cape Roque, where several sperm-whales were seen playing about her. While the crew were watching them, they suddenly beheld a sight that filled every man on board with terror. Starting straight from the bosom of the deep, a gigantic serpent, with a diameter at its largest part 8 or 9 ft., rose and wound itself twice round the largest of the whales, which it proceeded to crush in genuine boa-constrictor fashion, in spite of a frantic struggle by the whale. The ribs of the ill-fated fish were distinctly heard cracking one after the other. Five days later they saw a serpent 200 ft. in length in full career.

Of no less a ship than her majesty's yacht the *Osborne*, the captain and officers, 1877, June, forwarded an official report to the admiralty containing an account of a sea-serpent's appearance off the coast of Sicily June 2: 'The time was five o'clock in the afternoon. The sea was exceptionally smooth, and the officers were provided with good telescopes. The monster had a smooth skin, devoid of scales, a bullet-shaped head, and a face like an alligator. It was of immense length, and along the back was a ridge of fins about *fifteen* ft. in length and *six* ft. apart. It moved slowly, and was seen by all the ship's officers.'

This account was supplemented by a sketch from the pencil of Lieut. W. P. Hynes of the *Osborne*, who to the

above description adds that the fins were of irregular height, and about 40 ft. in extent, and 'as we were passing through the water at ten and a half knots, I could only get a view of it "end on"' It was about 15 or 20 ft. broad at the shoulders, with flappers or fins that seemed to have a semi-revolving motion. 'From the top of the head to the part of the back where it became immersed, I should consider about 50 ft., and that seemed about a third of the whole length. All this part was smooth, resembling a seal.'

The capt. and surgeon of the steamship *Nestor* made affidavit to seeing, in smooth sea near Malacca, a creature like a salamander, head 20 ft., body 45–50, vertically undulating tail 150 ft.; transversely striped black and yellow. It followed the ship. Such are some of the testimonies; and many are said to be withheld for fear of ridicule. The most positive and noteworthy, on this coast, is that of Granville B. Putnam, a well-known Boston teacher, son-in-law of the late Pres. Hitchcock of Amherst College. 1886, Aug. 12, at 1 P.M., looking about ⅛ of a mile off shore at Pigeon Cove, Cape Ann, Mass., the sea still and smooth, he and Calvin W. Pool, town-clerk and surveyor (both with small telescopes, and standing at an elevation of 50 ft. above the shore, with about 50 people attracted to the sight), saw a serpent-like monster, estimated to be 100 ft. long, moving northward, obliquely to the outgoing tide, at the rate of 4 or 5 m. an hour, with sinuous vertical movement—the head and 15 ft. of neck fully visible except as obscured by thrown-up foam, and followed by a dozen ridges of undulation each 6 or 7 ft. apart The size of the head was compared to a 10-gallon keg, and that of the body to a flour-barrel. Watched till a half mile away, the creature rested at full length a moment, and sank out of sight. Mr. Putnam says the appearance was quite unlike that of porpoises, with which he is familiar

The chief point at issue is that of the zoological determination of the forms reported to have been seen. Gigantic cuttle-fishes, now proved to have a veritable existence, might in many cases imitate an elongated marine form, swimming near the surface of the sea. Certain fishes, such as the Basking Shark (*Selache maxima*), would also under certain circumstances appear as unusual marine forms; and as Dr. Andrew Wilson, of the Edinburgh Medical School, has pointed out, the well-known Tape-fishes (*Gymnetrus Banksii*) would very accurately reproduce the features of a marine snake, especially when these fishes, as is well known, are developed to immense size. The marine snakes or *Hydrophidæ* of the Indian Ocean would also serve to personate the 'great unknown,' if largely developed. Flocks of shags swimming close to the water's edge might resemble a sea-serpent swimming along the top of the water (see *Nature*, 1878, Sep.); but a flock of birds would have been readily detected by Capt. M'Quhae, by Mr. Putnam, and by many other observers. For the scientific aspects of this question, consult 'The Sea-Serpents of Science,' in Dr. Andrew Wilson's vol., *Leisure-Time Studies* (Chatto & Windus, London 1878).

SEA'-SHORE, in Law: land on the border of the sea between high-water and low-water mark. In England an individual owner holds sea-shore lands subject to the public rights of navigation and fishery. In the United States the several states regulate the use of their sea-shores at their discretion, except where the laws of congress interfere. In Massachusetts and Maine, proprietors of adjoining lands on bays or arms of the sea own down to low-water mark, subject to the public right of fishery and navigation.

SEA'-SICKNESS: nausea accompanied by retching and vomiting, experienced on a vessel at sea, or as result of a similar motion. Its premonitory symptoms often appear almost immediately after a susceptible person is exposed to the motion of a vessel or boat, and are as distressing as the vomiting itself—e.g., vertigo and headache, with a peculiar sinking and distress about the pit of the stomach. Vomiting usually soon comes on, with convulsive heaving of the stomach, and such indescribable prostration as often to render the patient utterly regardless of what is going on around him, and indifferent to life. Moreover, deadly pallor, profuse cold sweat, and diarrhea, are more or less commonly present. The susceptibility to this affection varies extremely in different persons. Some never suffer from it, others only on their first voyage, and others, again, in every voyage; with some it continues but a few hours, while others suffer almost continuously throughout a long voyage. In the great majority of cases, the sickness disappears in a few days, unless the weather be very boisterous. It almost always ceases on landing, though some giddiness may remain for hours, the patient when walking feeling as if the earth were rising up under his feet. Infants and aged persons are supposed to possess comparative immunity from sea-sickness: as a general rule, women suffer more than men. According to Dr. Althaus, persons with a strong heart and slow pulse generally suffer little from sea-sickness; while irritable people, with quick pulse and tendency to palpitation, are more liable to it; and he thus accounts for different liability of different nations to this affection; 'for, as a rule, the French and Italians, being of a more irritable temper, suffer most from the disorder, the Germans less, and the English least.'

The primary cause (or rather condition) of sea-sickness is the motion of the ship; and the *pitching* of a vessel, or alternate rising and falling of the bow and stern, is especially apt to produce it. It is less felt in large and heavily ballasted vessels, because the movements referred to are least perceptible in them. How this cause operates is a subject which has been and is much discussed. It has been referred to an accumulation of blood in the spinal cord; to movement of the fluid in the semicircular canals of the internal ear; to a reflex disturbance in the brain caused by the confusion of the

sense of sight by the motion of objects—the floor, the walls, chairs, etc.—usually regarded as fixed; to a commotion of the abdominal viscera; to surcussion of the cerebrospinal fluid; to a reflex nervous disturbance caused by the unsteadiness of the surface on which one treads; and to a variety of other supposed causes.

Those who are susceptible to sea-sickness may at least diminish the severity of the vomiting by assuming, and retaining, the horizontal position, as nearly as possible in the center of the ship's movement, and keeping the eyes closed. The compression of the abdomen, by means of a broad tight belt, sometimes gives relief. A few drops of peppermint on a lump of white sugar, or two or three peppermint wafers, or cracked ice, will sometimes check the tendency to vomiting in persons who suffer only slightly. Effervescent beverages, such as champagne or carbonated mineral waters or ginger ale, or even a glass of beer will sometimes subdue the nausea. The bowels should be kept open, and the food should be simple. A little arrowroot, flavored with brandy or sherry, is usually a kind of food that will most easily remain on the stomach, when the severity of the symptoms is abating.

SEA'SIDE GRAPE (*Coccoloba uvifera*): a small sea-coast tree, of nat. order *Polygoneæ*, native of the West Indies. It has orbicular, cordate, leathery, shining, entire leaves, and a pleasant, subacid, eatable fruit, somewhat like a currant, formed of the pulpy calyx investing a bony nut. The extract of the wood is extremely astringent, and is sometimes called JAMAICA KINO. The wood itself is heavy, hard, durable, and beautifully veined.

SEASON, n. *sē'zn* [F. *saison*, due time, fit opportunity; Sp. *sazon*, time of maturity; *sazonar*, to ripen, to bring to maturity—from L. *satĭō* or *satĭōnem*, a sowing; *satus*, sowed; *serĕrĕ*, to sow]: *literally*, the sowing-time; suitable or convenient time; any particular time, as distinguished from others; one of the four divisions of the year, spring, summer, autumn, winter; a period of time not very long; in *OE.*, that which gives a relish: V. to mature; to become mature; to prepare for use; to inure; to render palatable; to temper; to qualify by admixture; to imbue; to become fit for its proper use; to dry thoroughly, as timber; in *OE.*, to savor. SEA'SONING, imp. *-zn-ĭng:* N. anything added to impart relish. SEA'SONED, pp. *-znd:* ADJ. dried and hardened; matured; rendered strong; flavored with condiments or spices, as food. SEA'SONLESS, a. *-zn-lĕs*, without the succession of the seasons. SEA'SONABLE, a. *-ă-bl*, happening in due season; done at the proper time; timely. SEA'SONABLY, ad. *-blĭ*. SEA'SONABLENESS, n. *-bl-nĕs*, the quality or condition of being seasonable. SEA'SONAL, a. *-zn-ăl*, pertaining to the seasons. IN SEASON, at the right time; sufficiently early. OUT OF SEASON, too late; beyond the proper time. SEASON TICKET, a ticket or pass for traveling on a railway

at pleasure, to a certain station, and for an extended period; a ticket of admission to a place of public amusement for an extended period.—SYN. of 'seasonable': timely; fit; opportune; convenient.

SEASONS: the term applied to the periods into which the year is naturally divided by the characteristic changes in temperature that are directly due to the annual motion of the sun in declination. Astronomically, the year is divided into four seasons of nearly equal length. Spring, which begins when the sun crosses the equator going northward, lasts about 93 days. Summer begins when the sun reaches the summer solstice, and lasts about 94 days. Autumn begins when the sun crosses the equator again, going southward, and lasts about 90 days. Winter begins when it reaches the winter solstice, and lasts 89 days.

Arbitrary as these divisions may seem, however, they are not applied in either popular or historical reference to the seasons. In such cases the term refers to the four periods which, especially in the Temperate Zones, are well-marked by the annual changes in climate and conditions of vegetation. As the result, the dates from which they are supposed to commence vary widely, according to climatic and other local conditions. In the United States and Canada, for example, spring is supposed to embrace the months of March, April, and May; summer, June, July, and August; autumn, September, October, and November, and winter, the remaining three months, December, January, and February. In England, however, spring is supposed to begin in February; summer, in May; autumn, in August, and winter, in November. In the tropical countries, the seasons are not so well marked, and, though there may be four well-defined seasons, they are often divided into but two classes, one of which is known as the 'wet,' and the other as the 'dry' season.

Physically, the same variations in the earth's conditions produce the zones, the difference in the length of day and night, and the changes in seasons. Thus, those regions which lie in close proximity to the polar circles have winter during the greater part of the year, owing to the fact that they receive only very oblique rays from the sun. In the northern regions of Siberia and Lapland, for example, the following climatic conditions ordinarily prevail: 'June 23, snow melts; July 1, snow gone; July 9, fields quite green; July 17, plants at full growth; July 25, plants in flower; Aug. 2, fruits ripe; Aug. 10, plants shed their seed; Aug. 18, snow.' That is to say, the snow continues on the ground from Aug. 18 of one year to June 23 of the subsequent year, which is 309 days out of a possible 365 days. As the result, the three seasons—spring, summer, and autumn—together contain but 56 days, or just eight weeks, while the winter season embraces the remaining 44 weeks of the year.

According to Peary, the summer season in these extreme northern countries is a genuine summer when it actually does make its appearance. In reference to his experiences in 1892, he says: 'It was almost impossible for us to believe that we were standing upon the northern shores of Greenland, with the most brilliant sunshine all about us, with yellow poppies growing at our feet, and a herd of musk oxen in the valley behind us. Down in the same valley I had found an old friend, a dandelion, in bloom, and had seen the bullet-like flight and had heard the energetic buzz of the bumblebee.'

In the most exposed habitable localities of the farthest north the period which can be designated as summer is of extremely brief duration, and such vegetation as may be able to thrust its way through the earth is of very stunted growth and passes away about as rapidly as it matures. Even in Sweden, and similar high latitudes, the period during which it is possible for the farmer to pursue any agricultural pursuit does not last longer than from eight to ten weeks, and yet the days are so long in which the sun sheds its heat upon the earth that the growth of vegetation is sufficiently rapid to bring the time of harvest before the soil is again covered with snow and ice.

In passing southward from the Arctic regions there is a gradual transition from cold to heat. In the Temperate Zone the seasons are distinctly defined, although the summers grow longer and the winters shorter as one approaches the Torrid Zone. It is here, however, that the year divides itself into the two periods of rainfall and drought, for the rays of the sun strike the earth in so nearly a vertical direction that the summer temperature is maintained through both the wet and the dry seasons. Moreover, as one crosses the equator the seasons gradually change, with the result that when it is summer in the North Temperate Zone it is winter in the South Temperate Zone.

The vertical and oblique direction of the sun's rays are caused by the revolution of the earth and the inclination of its axis. Thus, at different seasons of the year they fall obliquely 23½ degrees north and south of the equator. As the result, the earth between these two parallels represents the hottest section of the earth, not because there is more heat in vertical rays than there is in those that fall obliquely, but for the reason that, falling so perpendicularly, they spread over a great deal less surface of the earth.

In illustration of the climatic conditions which sometimes exist in certain portions of the Torrid Zones, one may turn to Brehm's description of the weather which prevailed in the deserts of inner Africa, undoubtedly some of the hottest spots on the earth's surface:

'Indescribable heat by day and enervating sultriness by night make the season almost unbearable, and against

neither heat nor sultriness is there any remedy. The torments are inconceivable to those who know nothing of such weather, when the thermometer registers up to 122° in the shade, and one is in constant sweat, without being conscious of it, so drying is the heat.'

As it is the slant of the sun's rays that is chiefly responsible for the conditions of heat, there is a gradual decrease in the degrees of warmth as one begins to pass from the equator towards the pole. Degree by degree as one advances the rays of the sun fall less and less vertically, and it is in the same proportion that the heat becomes tempered before reaching the earth. Although the parallel lines that have been marked upon the globe, therefore, arbitrarily define the limits of the Torrid, Temperate, and Frigid Zones, there are, of course, no such sudden changes in temperature or general climatic conditions. In fact, the gradations occur so gradually that they are imperceptible, the Torrid Zone spreading gradually into the Temperate Zone, the Temperate Zone into the Frigid. Thus, we see the term 'temperate' applied to countries in which there is a vast difference in temperatures. The country around Christiania in Norway, and along the Gotha in Sweden is known as 'temperate.' So, too, are the countries that border the Mediterranean, in Europe, and yet there is comparatively no comparison between the climatic conditions that exist in Scandinavia, with its deep snows and icy forests, and those at the other extreme of the zone, where the air is warm with sunlight and fragrant with the perfume of luxurious flowers. Cold as it may be in view of the temperature that is maintained in southern Europe, even Norway is warm when compared with Greenland, which is scarcely more than a glacier plateau wedged in between two frozen seas, and yet the same parallel passes through both of them. It is the same parallel, too, that passes through Ireland, where the differences between the mean of the warmest and the mean of the coldest month of the year is but 20 to 25 degrees, and through Siberian Irkutsk, where the variation is from 102 to 106 degrees; the same parallel that passes through Paris, where there is more dampness than cold, runs through Quebec, where the thermometer sometimes drops so low that even the mercury freezes; through Menton, with its luxurious palms, and Manchuria, where the firs are frequently covered with snow.

From these illustrations it may be seen that it is not the sun alone that determines the prevailing conditions of heat and cold. Much as it may influence the climatic changes that are known as seasons, the physical construction of the earth's surface also has much to do with them. The reason why the climate in western Europe is warmer than that which prevails in other countries in corresponding latitudes, therefore, is due to this cause. In occidental Europe, everything is well balanced—the

plains, the valleys, the plateaus, and the mountains—whereas, in oriental Europe there are too many plains and steppes. 'In Asia,' said Reclus, 'there are too many lofty, cold plateaus; Africa has too many deserts, and no broad, peaceful rivers; America, too many savannas, llanos, and pampas, and Australia has too little rain, too few rivers, too few mountains, and, like Africa, also, it has few deep gulfs, or projecting peninsulas.'

The salvation of the tropical regions is the abundant rains which water the land at that particular season of the year when the sun's heat is the hottest, for, just as the countries in the Temperate Zones are visited by more rains and snows than the Frigid Zones, so in the Tropical Zones the evaporation increases with the heat of the sun, with the result that a far greater quantity of water is returned to the earth in the form of rain. It is due to this oscillation of the rainy zone that some tropical countries have one wet and one dry season, while others present the phenomena of four seasons, two wet seasons and two dry seasons. Thus, in Colombia and Panama, the year is divided into four such periods, while in such countries as the regions of the Upper Amazon, there are but the two seasons. In every country, however, the normal epoch and abundance of the rains are greatly modified by the form of the coasts, the relief of the plateaus, the altitude of the mountains of the interior, the alternations of the monsoons, etc. At Calcutta, for example, the great rains are witnessed during June and July, while at Madras, the maximum precipitation is in November.

It must not be imagined, however, that even in the tropics the rain is constantly falling during the so-called wet seasons. On the contrary, instead of falling frequently and irregularly, selecting any hour of the day or night, the rainfall at these seasons seems to obey a sort of rhythmic law, commencing generally in the afternoon. Ordinarily during the night and in the morning the clouds that are to discharge their moisture are in process of saturation, but, somewhat after the noon hour has passed, they reach the point where they can retain no more moisture, at which moment the storm breaks violently, and continues for a surprisingly regular period of time. In referring to this regularity of the tropical rains, Reclus said:

'On many points of the coast-line of the sea of the Antilles, in Colombia and Mexico, the sky begins to discharge its burden of rain towards two o'clock in the afternoon; but the shower is expected, and all preparations for shelter are made beforehand, and in the evening one may go out of doors again without fear. In the same way in certain parts of tropical Brazil, the hours of the daily storm are so well foreseen that rendezvous can be appointed at the end of the rain. However, in tropical countries that are more abundantly watered the

showers which begin in the afternoon of each day last until a late hour at night, or even into the morning. On the open sea, where the immense surface of evaporation is sufficient to continually saturate the superincumbent atmosphere, the rains, of course, have a longer duration than on land, and they often continue for whole days.'

In certain countries in southern Europe rain falls most abundantly during the spring and autumn, the maximum precipitation, with some exceptions, being the highest during the fall of the year. The British Islands and the western coast of France are two sections that are comprised within this zone, and, while the true cause of this phenomenon is not yet proved, it is supposed to be largely due to the abrupt fall of the thermometer after the heat of summer and its effect upon the various atmospheric and marine currents. More to the north, in the Temperate Zone, it is in the summer that the rains appear more frequently, while on the other side of the equator it is in precisely the opposite way that, to quote Reclus, 'the counter trade-winds of the northwest, traveling with the sun, determine the greatest precipitation of moisture over the countries towards which they sink.' Within the Arctic Circle, however, the snows fall chiefly in the winter, or during those long nights which are several months in duration.

SEAT, n. *sēt* [Icel. *sæti;* Sw. *säte*, a seat: AS. *settan;* Ger. *setzen;* Icel. *setia*, to place, to let down: Ger. *sitzen;* L. *sedēre*, to sit]: that on which one sits, as a chair, a bench, or a stool; a sitting; right of sitting; a place in parliament; a post of authority; station; situation or position; site; a residence; a mansion; the manner of sitting a horse: V. to cause to sit down; to lie down; to place in a seat; to settle; to fix; to fit up with seats; to assign seats to. SEAT'ING, imp.: ADJ. the act of giving a seat: N. the material for making seats. SEAT'ED, pp. placed in a chair or on a bench; settled.

SEATON, *sē'ton*, WILLIAM WINSTON: 1785, Jan. 11—1866, June 16; b. King William co., Va. He studied under private tutors, took great interest in political affairs, and at the age of 18 joined the editorial staff of a Richmond newspaper. For a short time he edited a paper at Petersburg, then became proprietor of the *North Carolina Journal*, at Halifax, and on the removal of the state capital to Raleigh became one of the editors of the *Register*, published in that city. In company with a brother-in-law, Joseph Gales, Jr., he took charge of the *National Intelligencer*, at Washington, 1812. The two conducted the paper till the death of Mr. Gales 1860, when Seaton became sole editor, a position which he retained until the sale of the paper a little before his death. In company with Gales he published *Annals of Congress* (42 vols.); *Register of Debates in Congress* (14 vols.); and various other documents.

SEATTLE, *sē-ăt'tl:* city, cap. of Kings co., Wash.; on Elliott and Salmon bays, Pacific Ocean, and on the Columbia and Puget Sound, the Northern Pacific, Seattle and International, and the Great Northern railroads, 129 m. inland from the Pacific Ocean, and 804 m. by water from San Francisco. It fronts w. upon Elliott Bay, a branch of Puget Sound, which forms an extensive deep-water harbor 4 m. long and 2 m. wide. On the e. side is Lake Washington, a body of fresh water 22 m. long, from 2 to 4 m. wide. Lake Union and Green Lake, smaller fresh-water lakes, lie wholly within the city limits. The surface of the city is hilly, consisting principally of long ridges which rise to an elevation of about 300 ft. above the level of the sea. The costliest residences rise on terrace after terrace till thy reach the summit of the heights, then give way to beautiful country-seats that fringe Lake Washington, 25 m. long and 5 m. wide. The natural scenery surrounding the city is magnificent. Electric railways connect the city with Renton, lying 13 m. southeast, and Tacoma, 31 m. south. S. has many fine public buildings, churches, etc., and is the seat of the University of Washington (q.v.), the Seattle Seminary (Methodist), Immaculate Conception College (R.C.), Academy of Holy Names (R.C.), and several parish and private schools. The new public library cost $200,000, and supported by city taxation, contains about 60,000 volumes. The city is the commercial and industrial centre of a large region which contains very extensive natural resources, the most important of which are the lumbering, fishing, mining, and agricultural interests. The most important industrial establishments are shipyards, lumber and shingle mills, flour mills, iron works, rolling mills, foundries, and wood-working establishments. A careful estimate made by the Manufacturers' Association and the Chamber of Commerce, shows that in the year 1903 the number of establishments exceeded 1,400; capital invested, $16,000,000; employees, 16,000; wages paid, $13,000,000; value of products, $55,000,000. The power used in a great number of the mills and factories is electricity, generated by the falls in the rivers flowing down from the Cascade Mountains, furnished to consumers at a very low price. There are many mills and factories located just outside of the city limits, and the United States Navy Yard of Puget Sound nearby, contributes largely to the prosperity of the city. The commerce of the city has increased even more than the manufacturing interests during the past eight years. The harbormaster's report shows that the shipments to local ports in 1903 amounted to $10,165,262, and the receipts to $7,032,755. The combined foreign and coastwise receipts and shipments, for the year 1903, amounted to $80,177,452. The city was named from an Indian chief, was occupied by white men first in 1852, was an isolated trading-post more than 20 years, began its career of prosperity 1873. Pop. (1910) 237,194.

SEA-TROUT: a popular name for various fishes, primarily for the common salmon-trout (*S. trutta*) of British waters. In other parts of the world various fishes more or less resembling it are called sea-trout, as the weakfish in the southern United States.

SEA-URCHIN: an echinoderm of the class *Echinoidea*, members of which differ from crinoids or starfishes in their compact spheroid, discoid or heart-shaped forms without arms or a stalk. The numerous species differ greatly in the number and arrangement of the calcareous plates forming the continuous test, and in the character of the spines and other appendages with which the latter is studded. Of both fossil and living forms about 250 genera and 4,000 species are known. Although representatives of the 400 or so living species occur in most seas they are more numerous in warm waters, the West Indian fauna being the richest in the world. Regular sea-urchins are distributed widely in the littoral zone, but the irregular ones are especially characteristic of deep waters and the southern oceans, some of them extending to the utmost abysses. The shallow-water forms being subjected to the constant beating of the surf along the rocky shores which they chiefly inhabit are provided with a highly developed system of suctorial ambulacral feet, by means of which they are enabled to retain a hold. Many species also possess the remarkable power of boring into solid rock in which they excavate chambers exactly fitting them, and increasing in size with their growth. Frequently the orifice representing the earlier dimensions of the chamber is too small to permit the urchin's escape and the animal is at once imprisoned in its cave and protected from any possibility of injury by the beating waves. The long-spined *Diadema* thus completely honeycombs the surface of the coral rock of the Bahama Islands, etc. Although this power of excavation is most displayed on soft calcareous rocks, the fact that solid granite is similarly bored in some parts of the world shows that it is not the result of a solvent action, but of a slow wearing away of the rock by the jaws and constant movements of the spines. Sea-urchins of most species swallow rock debris and sand in large quantities, digesting the abundant minute animal and plant life which it contains. Most of the species are gregarious, vast numbers collecting in certain areas on the sea-floor until their bodies completely pave the bottom. During the reproductive season, usually the summer, the ovaries and testes, found in separate individuals, become so greatly enlarged that they fill almost the entire interior of the test. Such forms are called sea-eggs, and this name is sometimes applied to regular sea-urchins generally. In some countries they are baked and eaten while in this condition. The egg-urchin (*Hipponoë esculenta*) of the West Indies is a large species so utilized. But very few species of sea-urchins are found in the shallow waters of the Atlantic coast of the United States.

SEAWEEDS.

SEA'WEEDS: the simpler kinds of plants which grow in the water. The term is restricted to the lower plants, and does not include the aquatic kinds of mosses, liverworts, fernworts, and flowering plants. Originally the term was applied exclusively to the plants which live in the seas and oceans, but these are now called 'marine seaweeds' to distinguish them from the 'fresh-water seaweeds' which grow in rivers, lakes, and ponds. The simplest of all plants, the blue-green slimes (*Cyanophyceæ*), are the lowest of the seaweeds. They occur mostly in fresh waters; some, however, are marine. The green seaweeds (*Chlorophyceæ*) are of considerably higher organization, the cells being distinctly nucleolated, and possessing well defined chromatophores, in which the green coloring matter resides. They include such single-celled types as the common green slimes (*Protococcus*).

The brown seaweeds (*Phæophyceæ*) are closely related to the green seaweeds, and differ from them mainly in having an additional brown coloring matter which hides the green color of the chromatophores. The simplest forms are minute few-celled plants, others are branching filaments, while still others are large, massive plants many feet in length, and composed of root, stem, and leaves. In all the mode of reproduction is of a simple type, showing their low grade in spite of the great size of some of the species. Among the larger plants of this group are the kelps (*Macrocystis, Lessonia,* etc.), devil's aprons (*Laminaria*) and rockweeds (*Fucus*). Some Pacific species of the first named genus attain a length of several hundred feet, and are doubtless the longest plants in the world. Nearly all brown seaweeds are marine, a few only living in fresh waters. The red seaweeds (*Rhodophyceæ*) are by far the most beautiful and interesting of aquatic plants. They are of a higher organization than those of the preceding groups. A few are composed of simple slender filaments, but they are more commonly multicellular stems, with roots below, and leaf-like or finely divided branches above. Although they are green plants, having well developed chromatophores in their cells, they have in addition a reddish or purplish coloring matter which hides the green color. This often gives them a beautiful color, which, added to their delicate and regular branches, makes them exceedingly attractive objects of study. They are commonly collected by seaside visitors, under the name of 'sea mosses.' A few species live in fresh waters, all the others being marine. Some species are edible, as notably the so-called 'Irish moss' (*Chondrus crispus*) of the Atlantic coast of America and Europe, from which is made the delicacy known as *blanc mange.*

All told there are about 15,000 species of seaweeds, of which about 1,000 are blue green slimes; 8,000 to 10,000 green seaweeds; 1,000 to 1,500 brown seaweeds; 2,000 to 2,500 red seaweeds; 100 to 200 stoneworts.

SEBACEOUS, a. *sĕ-bā'shŭs* [L. *sēbāceus,* a tallow-candle—from *sēbum,* tallow or suet]: made of tallow; fatty; containing or secreting fatty matter; pertaining to fat. SEBACIC, a. *sĕ-băs'ĭk,* derived from fat or oil, as *sebacic acid,* an acid derived from olein; pertaining to fat. SEBATE, n. *sē'bāt,* a salt of sebacic acid.

SEBAS'TE. See SAMARIA.

SEBASTIAN', SAINT. See SAN SEBASTIAN.

SEBASTIANI, *sā-bâs-tē-â'nē* or *-nē',* FRANÇOIS-HORACE-BASTION: marshal of France: 1772, Nov. 10—1851, July 20; b. Porta d'Ampugnano, village near Bastia, in Corsica. His father was a tailor; but his vanity led him to declare himself of noble descent and a distant relative of the Bonapartes. He entered the army as sub-lieutenant of infantry 1789. His rise, due to bravery in the field, was doubtless aided by his splendid physique and graceful manner. He became *chef-d'escadron* 1797, brigadier 1799, and was one of Napoleon's devoted partizans. He became general of brigade 1803, and was wounded at Austerlitz. In 1806 he was deputed to Turkey, to break the alliance of the Porte with Russia and England: his tremendous energy inspirited the sultan's terrified ministers, and in an incredibly short time he put the batteries defending the approach to Constantinople in readiness for action. The English fleet, however, at last gallantly ran the gantlet, losing two ships and 700 men. But the death of the sultan, and the treaty of Tilsit, ended French intrigues in Turkey, and Sebastiani was recalled 1807. On the exile of Napoleon to Elba, he gave in his adherence to the Bourbon government, but joined his old master on his return. After the revolution of 1830 he held official and diplomatic positions. Sebastiani died at Paris.

SEBASTIANISTAS, *sā-bâs-tē-â-nĭs'tas:* in Portugal and Brazil, persons who believe in the future return to earth of the king Dom Sebastian (1554-78), who fell in the battle of Alcazarquebir 1578, while leading his army against the Moors. It is said that some Sebastianistas still remain in Brazil. Several impostors, claiming to be Dom Sebastian, have appeared from time to time.

SEBASTIANO DEL PIOMBO, *sā-bâs-tē-â'no dĕl pē-om'bo:* 1485-1547; b. Venice: painter. First a noted musician, he became a pupil of Giovanni Bellini and Giorgione. He was known first by his painting of Chrysostom reading at a desk, with accessory figures. About 1512 he went to Rome by invitation of Agostino Chigi, whose house he adorned with frescoes. Michael Angelo admired his work; and, it is asserted by some, questioned by others, drew the figures of many subsequent pictures of Sebastiano, who supplied the rich Venetian coloring in which Michael Angelo's work was lacking. Four paintings referred to this co-working are the *Pietà,* in the Church of the Conventuali, Viterbo; a *Transfiguration,* and the

Flagellation, in the Church of Saint Pietro, Rome; and the celebrated *Raising of Lazarus,* in the British National Gallery. When Giulio de' Medici became pope, Sebastiano del Piombo received the office of Piombo [It., lead, referring to a leaden seal], and, satisfied with this mark of supremacy in art, he led an idle life. Of the few works that he subsequently executed are two painted on stone according to his own invention—*Christ Carrying the Cross,* and a *Madonna with the Body of Christ,* in the Berlin Gallery. In the same gallery is a *Dead Christ Supported by Joseph of Arimathea.* His many portraits are famous, and include popes and noblemen; e.g., Andrea Doria, in the Doria palace, especially fine. In the British Gallery is one of himself with Cardinal Ippolito de' Medici, and another of a lady in the character of St. Agatha.

SEBASTOPOL, *sĕb-as-tō'pol,* Rus. *sā-bâs-tō'pōl,* or, according to modern Greek pronunciation, SEVASTOPOL, *sĕv-* (*Sebastopolis,* the 'august city'): Russian seaport, fortress, and arsenal in the Crimea, government of Taurida. It is near the s.w. extremity of the Crimea, on the s. side of the magnificent harbor or roadstead of Sebastopol, one of the finest natural harbors in the world—an inlet of the Black Sea, stretching inland about four and a half miles from w. to e., about half a mile wide at the entrance, but immediately opening to the width of a mile, with average width about half a mile to the e. end. It is sheltered on the n. and s. by lofty limestone ridges shutting it completely in, with depth varying from 3 to 11 fathoms, and sufficient in several places to allow ships of the largest size to lie close to the shore. At the e. end, under the heights of Inkermann, the river Tchernaya enters the harbor through low marshy ground. The South Bay or Dockyard Harbor, extending about one and a half miles from n. to s., forms the harbor proper; and between it and Quarantine Bay, occupying rather more than half the peninsula thus formed, is the chief portion of the town of Sebastopol, on ground sloping irregularly upward. The town, previous to its destruction in the siege of 1854-5, was substantially built of stone, containing several handsome public edifices: the pop., including garrison, was 43,000. The docks, constructed for the Russian government by an English civil engineer, were among the most important works at Sebastopol; the dock basin, docks, and quays were of admirable design and construction. For defense of town and harbor from attack by sea, several forts of immense strength were built, of limestone faced with granite, on which the artillery in use at the time of the Crimean war was found to make little impression; they mounted a very large number of guns, and by their cross-fire completely protected every spot accessible to a hostile fleet. On the land side, the town, previous to the siege, was nearly undefended; but the earthworks and fortifications then successively extempor-

ized by the genius of Gen. Todleben, of which the Malakoff and the Redan were the most formidable, for many months kept the armies of France and England at bay.

The siege of Sebastopol by the allied English and French armies ranks among the famous sieges in history; it lasted 11 months, 1854, Oct.—1855, Sept.; the place sustained repeated bombardments; and the capture of the Malakoff and Redan, 1855, Sept. 8, at length forced the Russians to evacuate it, and retire to the n. side. The town was completely ruined; the docks and forts still standing were blown up by French and English engineers, and by the treaty of Paris (1856) were not to be restored; but the restrictions were removed by the abrogation of the neutrality of the Black Sea by the Conference of London (1871). The town has been partially rebuilt. Sebastopol was intended to be the station of the Russian Black Sea fleet, and as such to form a standing menace to Turkey; during the siege, that fleet was almost entirely destroyed; many of the ships having been sunk by the Russians across the entrance of the harbor by way of defense. Sebastopol as a naval station is at disadvantage from the ravages of the *Teredo navalis,* which soon render wooden vessels unseaworthy.—Sebastopol was founded on the site of a small Tartar village called *Akhtiar,* immediately after the Russian conquest of the Crimea 1783, under the orders of Empress Catharine II. The promontory on which Sebastopol stands is a spot of classical and historical interest. Here, perhaps on the site now occupied by the Greek convent of St. George, w. of Balaclava, stood the temple of the Tauric Artemis, in which, according to legend, Iphigenia, daughter of Agamemnon, was priestess. In later times the promontory was colonized by Greeks from Heraclea, in Asia Minor, and became known as the Heracleotic Chersonese. Two cities, successively built a few miles apart on the seacoast w. of Sebastopol, have left remains visible at the present day. In after times, the Chersonesus fell into the power of the Genoese, who established their headquarters at Balaclava, where the remains of the 'Genoese castles' on the heights still bear witness to their rule. See Kinglake's *Invasion of the Crimea.* Pop. 50,700.

SEBESTEN, *sē-bĕs'tĕn* (or SEBES'TAN, *-tăn,* or SEBESTEN PLUM) (the *Cordia Myxa*): tree of natural order *Cordiaceæ,* native of the East Indies: also its fruit. The tree has ovate leaves; and an egg-shaped fruit, succulent, mucilaginous, and emollient, with some astringency, and formerly an article of the European Materia Medica, being employed for the preparation of a lenitive electuary and of a pectoral medicine. It is believed to be the *Persea* of Dioscorides. It has a sweetish taste, and is eaten by natives of the Northern Circars of India, where it grows.

SEBIFEROUS, a. *sĕ-bĭf'ĕr-ŭs* [L. *sēbum,* fat; *fero,* I produce]: producing vegetable wax.

SEBORRHŒA: a disease of the skin in which there is a too abundant secretion from the sebaceous glands. Dermatologists recognize two forms: seborrhœa oleora, in which the skin is abnormally oily, and seborrhœa sicca, in which there is an accumulation of greasy scales in the skin. The first form is analogous to excessive perspiration, the hypersecretion being from the fat glands instead of the sweat glands. The treatment consists in washing away the oil on the skin with alcohol and then applying a talcum powder in which sulphur, in the proportion of one part to four or five, has been added. The second form of seborrhœa is associated with a chronic inflammation of the skin; when occurring on the scalp it is one of the conditions producing dandruff. After removing the scales with tar soap, oxide of zinc ointment or some other soothing application should be made.

SECALE, n. *sĕ-kā'lĕ* [L. *sĕcālĕ*, a species of grain, rye]: rye; ergot of rye; a genus of cereal grasses to which rye belongs. See RYE; ERGOT.

SECANT, in Geometry: a line that cuts a curve in two or more distinct points. If two of the points are made to approach each other along the curve, the limiting position of the secant is a *tangent* to the curve. In Trigonometry, the secant of an angle is the reciprocal of its cosine, viz., the ratio of the adjacent side to the hypotenuse. If a circle of radius unity is described about the vertex of the angle as center, the secant is represented by the terminal side extended to the point where it meets the tangent to the circle at the latter's intersection with the initial side of the angle. See TRIGONOMETRY.

SECCHI, *sĕk'kē*, PIETRO ANGELO: born Reggio, Italy, 1818, July 29; d. 1878, Feb. 26: Italian astronomer. He was a teacher of physics in the College of Loretto 1841-43; student of theology at Rome, and Georgetown, D. C., 1844-49; director of the Roman College (Rome) observatory since 1849, having reconstructed it; and invented a system and instrument (meteorograph) of weather observations, also a system of water-supply to Rome. He is widely known for his original researches in spectroscopic and other physics of astronomy. His English publications include *Researches in Electric Rheometry* (Smithsonian contributions 1859), and *Spectrum Observations on the Rotation of the Sun* (London 1870); those in Italian, researches on solar phenomena and physics, including a stellar catalogue 1867; and, in French, on similar subjects, the most noteworthy *Le Soleil: Exposé des principales découvertes modernes*, etc. (1870), and a French translation of *Dell' unita delle forze fisiche* (1875).

SECCO, n. *sĕk'ō* [It.—from L. *siccus*, dry]: in *paint.*, term applied to that kind of fresco-painting which absorbs the colors into the plaster and gives them a dry, sunken appearance.

SECEDE, v. *sĕ-sēd'* [L. *secedĕrĕ*, to go aside or apart, to separate—from *se*, aside; *cedo*, I yield, I retreat]: to separate one's self; to withdraw from fellowship or association. SECE'DING, imp.: ADJ. withdrawing from fellowship. SECE'DED, pp. SECE'DER, n. *-dėr*, one who secedes: in *Scot.*, member of a religious body which seceded from the Church of Scotland. See SECESSION.

SECERN, v. *sĕ-sėrn'* [L. *secerno*, I sever or separate—from *se*, aside or apart; *cernĕrĕ*, to sift]: to distinguish; in *physiol.*, to secrete or separate in the animal body, as mucus. SECERN'ING, imp. SECERNED', pp. *-sėrnd'*. SECERN'ENTS, n. plu. *-ĕnts*, in *anat.*, those vessels whose function it is to deposit matters separated from the blood, for the reproduction of the several parts of the body. SECERN'MENT, n. *-mĕnt*, the process or act of secreting.

SECESSION, n. *sĕ-sĕsh'ŭn* [L. *secessĭō* or *secessĭōnem*, a withdrawal; *secessus*, withdrawn—from *secedĕrĕ*, to go aside]: the act of withdrawing: in the *United States*, the withdrawal attempted by force of arms, of certain slave-holding states, from the American Union: in *Scot.*, the body of seceders from the Established Church about 1733 (for history of the Secession Kirk, see UNITED PRESBYTERIAN CHURCH: also MARROW CONTROVERSY). SECES'SIONISM, n. *-ŭn-ĭzm*, the principle of secession. SECES'SIONIST, n. *-ĭst*, one who defends secessionism.

SECES'SION, WAR OF; or WAR OF THE REBELLION, or CIVIL WAR IN THE UNITED STATES. See CIVIL WAR; UNITED STATES.

SECKEL, n. *sĕk'l*, or SICKLE, *sĭk'l* [from having originated on a farm afterward owned by Mr. *Seckel*]: small pulpy variety of pear of delicious flavor. It ripens about the end of Oct., but keeps good only a few days.

SECKENDORF, FRIEDRICH HEINRICH, COUNT VON: Franconian soldier and diplomat: b. Königsberg 1673, July 5; d. Meuselwitz, Germany, 1763, Nov. 23. He served in the war against the Turks on the Danube, and in that of the Spanish succession, and was present as an ambassador at the conclusion of the Peace of Utrecht. He also served in the war against Sweden, 1715, and against the Spaniards in Sicily, 1720. In 1726 he was ambassador to Berlin and gained over Frederick William I. to acknowledgment of the pragmatic sanction and an alliance with Austria. Seckendorf next served in the war of the Polish succession, gaining the victory of Klausen. During the Turkish war he was made field-marshal in 1737, and commander-in-chief. He was recalled, however, and imprisoned in the fortress of Grätz. Receiving no appointment when released he entered the service of Charles VII. of Germany against Maria Theresa. He cleared Bavaria of Austrian troops, but on the emperor's death in 1745 peace was established and Seckendorf retired to his castle at Meuselwitz, but in 1788 was imprisoned by Frederick II. of Prussia on a

charge of treason, and was released after six months upon the payment of 10,000 thalers.

SECKENDORF, GUSTAV ANTON VON, BARON ("PATRICK PEALE"): German dramatist and novelist: b. near Altenburg, Germany, 1775, Nov. 26; d. Alexandria, La., 1823. His works include: *Otto III., der gutgeartete Jüngling* (1805); *Kritik der Kunst* (1812); *Beiträge zur Philosophie des Herzens* (1814); *Des Vaters Bild* (1822); etc.

SECKENDORF, *sĕk'ĕn-dorf*, VEIT LUDWIG VON: 1626, Dec. 20—1692, Dec. 18; b. Herzogenaurach, in Upper Franconia: German statesman and scholar. He was of ancient noble family; his father was an officer in the 30 years' war. Educated at Coburg, Mühlhausen, and Erfurt, on his return to Coburg 1639, Ernest the Pious, of Gotha, became his patron, and he studied history and jurisprudence in the Strasburg University, after which he had charge of his patron's library. After 1652 he filled important public positions—in 1656 judge of the ducal court at Jena, where he had part in the reforms of the duke. By the Elector Frederick of Brandenburg (afterward King Frederick I. of Prussia) he was appointed chancellor of the new University of Halle. To him he had dedicated his standard work, *Deutscher Fürstenstaat*, a handbook of German public law. Later he entered the service of Duke Maurice of Zeitz. He was interested especially in Spener's pietistic reforms of the German Church. In 1685 he published *Der Christenstaat*, defending Christianity and suggesting reforms. His chief work was *Commentarius Historicus et Apologeticus de Lutheranismo, sive de Reformatione* (3 vols. 1688-92), written to refute Mainbourg's *Histoire du Lutheranisme*. It is a store-house of information.

SECLUDE, v. *sĕ-klôd'* [L. *seclūdĕrĕ*, to seclude—from *se*, aside; *claudo*, I shut]: to shut in a separate place; to separate or keep apart from company or society; to shut out. SECLU'DING, imp. SECLU'DED, pp.: ADJ. retired; living in retirement. SECLU'DEDLY, ad. *-lĭ*. SECLU'SION, n. *-klô'shŭn* [L. *seclūsus*, secluded]: the act of separating from society; solitude; retirement; private or humble life. SECLU'SIVE, a. *-sĭv*, that keeps separate or in retirement; that shuts out from society.

SECLU'SION OF THE INSANE: removal of the violent insane from the ordinary wards and fellowship of an asylum to a court, gallery, or room so situate and furnished that its solitary occupant can neither injure himself, nor injure nor disturb others. That seclusion of the insane should be resorted to only as a remedial agent, and in general for short periods, and by the medical attendant, are now received as axioms. See INSANITY; LUNATIC ASYLUM.—Consult Buckuill and Tuke, *Psychological Medicine;* D. Hack Tuke, *Chapters in the History of the Insane in the British Isles* (1880).

SECOND, a. *sĕk'ŭnd* [F. *second*, second—from L. *secundus*, the next after—from *sequi*, to follow: It. *secondo*]: the next in order to the first: other; next in value, power, excellence, rank, or relationship; inferior; following in the next place: N. one next to the first; one who accompanies another in a duel to direct or support him; a supporter: the 60th part of a minute of time or motion (see below): in *music*, interval between two succeeding sounds of a scale: V. to support or assist; to encourage; to promote. SEC'ONDING, imp.: N. special in *Brit. milit.*, temporary retirement of certain officers for acceptance of civil employment under the crown. SEC'ONDED, pp. SEC'ONDER, n. *-ĕr*, one who first supports a motion; a backer. SEC'ONDLY, ad. *-lĭ*, in the second place. SECONDO, n. *sĕ-kŏn dō* [It.]: in *music*, the second part. SECONDS, n. plu. *sĕk'ŭndz*, an inferior and coarse flour remaining after the finest has been separated. SECOND ADVENT, or SECOND COMING, in *theol.*, the expected second coming of Christ: see SEVENTH-DAY ADVENTISTS. SECOND COUSIN, the son or daughter of a cousin. SECOND DISTANCE, that part of a picture between the foreground and background. SECOND-HAND, a. that has been used or worn; not new; not original or primary; dealing in old goods. AT SECOND HAND, ad. not primarily; not originally. SECOND-RATE, a. of the second size, rank, quality, or value: N. the second order in size, etc. SECOND SIGHT, supposed power of seeing things future or distant (see below). SECOND-SIGHTED, a. having the supposed power of seeing the future. SECONDARY, a. *sĕk'ŭnd-ĕr-ĭ*, coming after or succeeding the first; not of the first order or rate; not primary; subordinate: N. that which is secondary; a delegate or deputy. SEC'ONDARILY, ad. *-ĭ-lĭ*. SEC'ONDARINESS, n. *-ĭ-nĕs*, the state of being secondary. SEC'ONDARIES, n. plu. *-ĭz*, the quills which rise from the forearm of the wing of a bird. SECONDARY CIRCLES, or SEC'ONDARIES, in *astron.*, great circles of the sphere perpendicular to the plane of another great circle, and passing through its poles, which latter is regarded as the *primary*. SECONDARY COLOR, any two of the primary colors united in equal proportions. SECONDARY FEVER, a fever arising after the crisis of another disease. SECONDARY QUALITIES, the qualities of bodies, such as color, taste, and smell, which may be separated from them. SECONDARY ROCKS or STRATA, in *geol.* (see SECONDARY). SECONDARY PLANET, a planet revolving about a primary planet, as the moon around the earth. SECONDARY TINTS, those of a subdued kind, such as grays.—SYN. of 'secondary, a.': second-rate; subordinate; inferior; delegated; deputed.

SEC'OND [see SCRUPLE]: 60th part of a minute, whether of time or of angular magnitude: see MINUTE. In old treatises we find seconds distinguished as *minutæ secundæ*, from minutes or *minutæ primæ*. The 60th part of a second was called a third; but instead of this and succeeding subdivisions, decimal fractions of seconds are now used.

SEC'ONDARY, in Geology: designation synonymous with Mesozoic, denoting that large section of the fossiliferous strata which includes the Triassic, Oolitic, and Cretaceous rocks. The strata grouped under this title are separated from the inferior and superior deposits more by their organic contents than their petrological structure, and this separation is more evident between them and the older rocks, than between them and the newer; yet recent discoveries have shown that the St. Cassian Beds form a connecting link between the Permian and Triassic epochs: they contain a series of fossils partly Paleozoic and partly Mesozoic in their facies.

The appearance of the great types of all subsequent organisms in the Secondary rocks has suggested the grouping of the fossiliferous strata in respect of their fossils into only two great divisions—viz., the Paleozoic and the Neozoic—this last term including the Secondary and Tertiary periods. The common classification, however, is Paleozoic, Mesozoic, Tertiary, and Quaternary.

SECOND SIGHT: superstition or belief formerly common in the Scottish Highlands and Isles, where it is known by the Gaelic appellation *Taibhsearachd*, signifying a spectral or shadowy appearance. Certain persons, called seers or wizards, were supposed to possess a supernatural gift, by which they involuntarily foresaw future events, and perceived distant objects as if they were present:

> As the sun,
> Ere it is risen, sometimes paints its image
> In the atmosphere, so often do the spirits
> Of great events stride on before the events,
> And in to-day already walks to-morrow.
>
> WALLENSTEIN.

This is to depict the lofty and poetical view of the subject, as illustrated in classic fable and early history. The Highland seer, however, was conversant chiefly with the scenes and occurrences of ordinary life. 'A man on a journey far from home falls from a horse; another, who is perhaps at work about the house, sees him bleeding on the ground, commonly with a landscape of the place where the accident befalls him. Another seer, driving home his cattle, or wandering in idleness, or musing in the sunshine, is suddenly surprised by the appearance of a bridal ceremony or funeral procession, and counts the mourners or attendants, of whom, if he knows them, he relates the names, if he knows them not he can describe the dresses. Things distant are seen at the instant when they happen (Dr. Johnson's *Journey to the Hebrides*). 'The vision makes such a lively impression upon the seers,' says Martin, in his account of the Western Islands, 1703, 'that they neither see nor think of anything else except the vision, as long as it continues; the eyelids of the seer are erected, and the eyes continue staring until the object vanish.' The power of the seer was involuntary and painful—it was no source of gain. There have been attempts to reduce to a system these symbolical appearances; but such attempts seem in vain: the evidence is vague and confused, and the incidents

are often most trivial. The revelations, indeed, were commonly to poor illiterate men, predisposed from the nature of their country—wild, dreary, and remote—and from their half-idle, solitary life, to melancholy and superstition. We find the S. S. coloring portions of the story of Wallace and Bruce, and associated with the tragic fate of James I. of Scotland. A Scottish seer is said to have foretold the unhappy career of Charles I., and another the violent death of Villiers, Duke of Buckingham. In 1652 a Scottish lawyer, Sir George Mackenzie, afterward Lord Tarbat, made inquiries concerning this supposed supernatural faculty, and addressed a minute account of its manifestations to the celebrated Robert Boyle; which, with other relations on the same subject, is published in the correspondence of Samuel Pepys. Next came Martin's copious description; then a Highland minister, the Rev. John Fraser of Tyree, collected *Authentic Instances* (1707); and 1763 appeared the ambitious treatise of *Theophilus Insulanus*, or Macleod of Hamir, which contained the narratives previously set forth, with the addition of nearly a hundred others, gathered by himself from various sources, also numerous letters from Highland ministers. This work, which was exhaustive in scope, was made ridiculous by its display of vanity and credulity. The publication of Dr. Johnson's memorable *Journey to the Hebrides* (1775) revived the subject. The sage was naturally superstitious, and was eager to believe in the possibility of messages from the other world. The evidence, however, was not complete; and with that love of truth which was one of his stout virtues, he confessed that he never could 'advance his curiosity to conviction, but came away at last only willing to believe.' The modern thought certainly tends fully to agree with his result of disbelief; but will have no use for that part of his argument against S. S. drawn from its necessarily being a special exercise of divine power. If it were proved real to day, it would be readily referred to some natural law whose operation surprises only because it has hitherto been little known. The *special* exercises of divine power are, in the Christian thought of the present day, reserved for a different order of effects. Since education has penetrated into the Highlands and Isles, and intercourse with other parts of the kingdom has been facilitated, the belief in S. S., as in astrology and witchcraft, has almost disappeared. It never had the cruel and revolting features of witchcraft—formerly prevalent in the Lowlands; and it still seems picturesque enough to serve the purposes of poetry and romance.

SECRET, a. *sē'krĕt* [F. *secret*, secret—from L. *secrĕtus* separate, apart—from *secerno*, I sever or separate—from *se*, aside; *cerno*, I distinguish: It. *secreto*]: concealed; hidden kept from the view or knowledge of all except those concerned; not revealed; secluded; private; not apparent occult; obscure; known to God alone: N. something studiously concealed; something undiscovered or unknown. SE'CRETLY, ad. *-lĭ*, not publicly; not openly; with intention not to be known; privately. SECRECY, n. *sē'krē-sĭ*, state

of being secret; solitude; retirement; privacy; concealment from all persons except those concerned; close silence. SE'CRETNESS, n state of being hidden; concealment. IN SECRET, privately; in a state or place not seen.—SYN. of 'secret, a': hidden; unrevealed; concealed; retired; private; unseen; faithful; occult; secluded; unknown; obscure; recondite; covert; latent; clandestine; privy.

SE'CRET [Lat. *secreta*, i.e, *oratio*, the secret prayer]: one of the prayers of the Mass (q.v.) in the Rom. Cath. Church; of the same general form with the 'Collect,' but recited by the priest in so low a voice as not to be heard by the people. It follows immediately after the oblation of the eucharistic bread and wine. This use of silent prayer in the public service is one of the subjects of controversy between Rom. Catholics and Protestants.

SECRET, DISCIPLINE OF THE (Lat. *Arcani Disciplina*): a discipline of the early church, founded on the words of Christ, 'Give not that which is holy to dogs,' Matt. vii. 6 (comp. Heb. v. 12–14; I Cor. iii. 1); in virtue of which Christians fully initiated in the doctrine and practice of the church withheld from pagans and from catechumens in the preparatory stage the knowledge of certain doctrines, and the liberty of presence at certain rites connected with the most solemn mysteries of the Christian religion. This practice originated in view of the danger of persecution arising from the obloquy drawn upon the church from the false and monstrous conceptions of its doctrines circulated among pagans; also because of some supposed danger of shocking too suddenly the half-formed convictions of catechumens by too broad an utterance of the more difficult Christian doctrines. Against the calumnious misconceptions of the pagans, the earliest of the so-called 'Apologies' are addressed; and it seems certain that at the time at which Justin wrote his first Apology, middle of the 2d c., no objection existed against speaking openly of the mystery of the Eucharist (see *Justini Apol.*, I. 66). Very soon after this, however, this 'Secret' is clearly traceable; and it seems to have contributed to the development of mysticism in connection with the sacramental doctrine. The Discipline of the Secret appears in several forms—(1) Both unbelievers and catechumens were removed from the church at the commencement of that portion of the liturgy which specially relates to the celebration of the Eucharist —the so-called *Missa Fidelium:* see MASS. (2) The lectures addressed by the presiding teacher to the great body of the catechumens in general were confined to the general doctrines of Christianity. The more mysterious doctrines, those which regarded the sacraments of Baptism and the Eucharist, called 'Mystagogic,' were communicated only at the close, and to those only who had undergone the preliminary probation. (3) The Eucharist, if referred to at all in the presence of the uninitiated, was spoken of in words so conceived as to conceal its nature. Many curious examples of this concealment might be cited. Origen, alluding to the Eucharist (Hom. 8, in Exod. 4), says merely: 'The initiated know what I mean.' When Chrysostom

was writing to Pope Innocent I. an account of a tumult in the church at Constantinople, in which the sacred cup was overset, and the consecrated elements spilled, he says, without reserve, 'The blood of Christ was spilled.' But Palladius, the deacon, in his Life of Chrysostom, which was designed for the pagans as well as for the Christians, takes the precaution to use the words, 'The symbols which are known to the faithful.' Still more curiously, Epiphanius, in citing the well-known words of the eucharistic formula, 'This is my body,' suppresses the word under which the mysterious idea is contained, and writes, 'This is my *that thing*': *Touto mou esti tode.* A very curious example of this amphibological language regarding the Eucharist is in a Greek inscription discovered some years since at Autun, France (see *Edin. Rev.*, 1864, July).

There is some uncertainty as to the period during which this discipline lasted in the church. It commenced probably in the time of Justin, as his contemporary, the heretic Marcion, is known to have protested against it as an innovation (Neander's *Kirchengeschichte*, I. 540). It is thought possible by some that Justin's mode of writing was exceptional, and that the Secret may have been in use before his time. On the other hand, it is certain that it outlived the period out of whose conditions it arose, and was maintained long after the ages of persecution. The traces of its observance had not disappeared in the 6th c.—See MYSTAGOGUE. Schelstrate, *Diss. de Disciup. Arcani*, 1685; Scholliner, *Diss. de Discip. Arcani*, 1756; and on the Protestant side, Tenzel, *De Discip. Arcani* (in reply to Schelstrate); Rothe, *De Disc. Arcani*, Heidelberg 1831. See also Smith and Cheetham's *Dict. of Christian Antiq.* ('Disciplina Arcani').

SECRETARIES OF EXECUTIVE DEPARTMENTS, in the United States Government: head officers in the several departments: they are the constitutional advisers of the president; are appointed by the president (with the consent of the senate), and are removable at the will of the president. Collectively they are known as the 'cabinet' of the president. These departments are as follows: State, Treasury, War, Navy, Justice, Interior, Post-office, Agriculture and Commerce and Labor. The SECRETARY OF STATE is charged with the conduct of the foreign affairs of the government; he carries on the correspondence of the government with the ministers of foreign powers, and instructs the U. S. ministers and other representatives in foreign countries. He is the keeper of the great seal of the United States, is custodian of the archives, and publishes the laws of congress. The chief officers of the department of state, under the secretary, are the assistant secretary, the 2d assistant secretary, and the 3d assistant secretary; the chief clerk, the heads of the bureau of indexes and archives, of the diplomatic bureau, consular bureau, bureau of accounts, of rolls and library, of appointments, and also of passports. The office of

secretary of state is traditionally esteemed the post of honor in the cabinet, and sometimes he is spoken of as 'premier,' but improperly, for neither by constitution, nor law, nor custom has he any control whatever in any department of the government save his own. The president usually chooses for secretary of state one of the foremost leaders of his party, or even one of his competitors for the nomination to the presidency: thus, e.g., Lincoln chose his competitor Seward. The 3d, 4th, 5th, and 6th presidents were at first promoted to the state department as great political leaders, and stepped thence direct to the presidency.—THE SECRETARY OF THE TREASURY is minister of finance; he prepares plans for improving the revenue and strengthening the public credit; superintends the collecting of the revenue; grants warrants for payment of demands on the treasury, and is charged with many other functions, as appears from a partial list of the assistant secretary and other officers subordinate to him: 3 assistant secretaries; chief clerk; 1st and 2d comptroller; chief of customs division; 1st, 2d, 3d, 4th, 5th, and 6th auditor; treasurer of the U. S.; assistant treasurer; register of the treasurer; comptroller of the currency; director of the mint; solicitor of the treasury; commissioner of internal revenue; 2 deputy commissioners of internal revenue; supervising inspector-general of steam vessels; supervising surgeon-general of marine hospital service; general superintendent of life-saving service; chief of secret service; bureau of engraving and printing.—The SECRETARY OF WAR (who is always a civilian, as is also the secretary of the navy) performs such duties concerning the military service as may be imposed on him by the president; he has supervision of the purchase of army supplies, transportation, etc., and of expenditures under the appropriations made by congress for the support of the army. There is in his office an assistant secretary and a chief clerk. The military bureaus of the war department are those of the adjutant-general; inspector-general; quartermaster-general; surgeon-general; paymaster-general; chief of engineers; commissary-general; judge-advocate-general.—The SECRETARY OF THE NAVY discharges toward the navy such duties as are assigned to him by the president; he is charged with general superintendence of construction, manning, equipment, and employment of war vessels. He has an assistant secretary. This department includes the following bureaus, whose chiefs are officers of the navy; bureau of yards and docks; of equipment and recruiting; of ordnance; of construction and repair; of steam-engineering; of medicine and surgery; of supplies and accounts; office of judge-advocate-general; inspector of pay corps.—The ATTORNEY-GENERAL (head of the department of justice) is the chief public prosecutor and standing counsel of the government; he is the official superior of the U. S. district attorneys and of the U. S.

marshals throughout the states; and he is the president's legal adviser in all questions of constitution and law that arise in administering the government. His principal assistants are: chief clerk; law clerk; solicitor-general; 1st assistant attorneys-general and the solicitor, state department.—The SECRETARY OF THE INTERIOR has numerous officers subordinate to him, viz.: 1st assistant secretary; assistant secretary; chief clerk; commissioners of patents, pensions, the general land office, Indian affairs, education, and railroads respectively; director of the geological survey; 2 deputy commissioners of pensions.—The POSTMASTER-GENERAL has duties defined by his title. Under him are the following chief officers: 1st, 2d, 3d assistant postmasters-general; head of office of foreign mails; superintendent of money-order system; superintendent of the dead-letter office.—The SECRETARY OF AGRICULTURE has supervision of all public business relating to agriculture. Subordinate to him are the assistant secretary; chief of the Weather Bureau; statistician; entomologist; botanist; chemist; microscopist; etc.—The SECRETARY OF COMMERCE AND LABOR has supervision of the following bureaus: corporations, labor, immigration, statistics, navigation, foreign commerce, standards, census, the light house board, light house establishment, steamboat inspection service, coast and gradetic survey, commissioner-general of immigration, and the immigration service at large, commissioners of immigration, shipping commissioner, and the fish commission.

SECRETARY, n. *sĕk'rĕ-tā-rĭ* [F. *secrétaire;* It. *secretario,* a secretary—from mid. L. *secretārĭus,* a confidential officer—from L. *secrētus,* secret (see SECRET)]: a confidential person employed to assist another in conducting correspondence, in drawing out documents, etc.; the head clerk of a man of business, or of a public company: minister of state intrusted with the management of a particular department of public business. SEC'RETARYSHIP, n. *-shĭp,* office of a secretary. SECRETAIRE, n. *sĕk-rĕ-tär'* [F. *secrétaire*]: kind of writing-table fitted with pigeon-holes, drawers, etc.

SEC'RETARY, or SECRETARY FAL'CON, or SECRETARY BIRD, or SER'PENT-EATER (*Gypogeranus*): genus of birds of prey, variously placed by naturalists among the *Falconidæ* and the *Vulturidæ;* also by some constituted into a distinct family, *Gypogeranidæ.* The legs are very long, as in the *Grallæ,* to which, however, there is no other resemblance. The *tibiæ* are completely feathered, but the *tarsi* and toes are destitute of feathers. The tarsi are covered in front with long, large scales. The toes are armed with sharp claws; but they are short, and the feet are not formed for grasping. The hind-toe is very short. The neck is much longer, and the whole form of the bird more slender than in the Falconidæ. The wings are long, and armed with a blunt spur at the shoulder. The tail is very long. The best-known species is an inhabitant of the arid plains of s. Africa. It is about 3 ft. in length; plumage bluish-gray. It has an occipital crest of feathers without barbs at the base, which can be raised or depressed at pleasure, and the name Secretary was given to it by the colonists at the Cape of Good Hope from their fancied resemblance to pens stuck behind the ear. It feeds chiefly on reptiles of all kinds, which it devours in great numbers. The secretary is often tamed as a protector of poultry-yards; but if not sufficiently fed, is apt to help itself to a chicken or duckling. An attempt has been made to in-

troduce this bird into Martinique, in order to reduce the number of venomous serpents in that island.—Another species appears to exist in more n. parts of Africa, as about the Gambia; and a bird, more widely different, in the Philippine Islands.

SECRETARY-AT-WAR: formerly a high officer of the British ministry, in control of the financial arrangements of the army, and the responsible medium for parliamentary supervision in military affairs. During the Russian war, the evils of divided authority led to the creation of a Sec. of State for War (see SECRETARY OF STATE) to control all the military departments, in whose superior office the secretaryship-at-war was merged 1855; and in 1863 the former office was formally abolished.—See SECRETARIES OF EXECUTIVE DEPARTMENTS, in the U. S. Government.

SECRETARY OF LEGATION: principal of the persons belonging to the suite of an ambassador or envoy. A Secretary of Legation is appointed by the sovereign power or executive head of the state, and is a species of public minister, being the trusted assistant of his chief, and having under the law of nations the same immunities as an ambassador or envoy. During the absence of the minister plenipotentiary or envoy the secretary of legation discharges his duties.

A secretary of embassy or legation must not be confounded with the private secretary of an ambassador appointed and paid by him, who has none of the privileges and immunities above mentioned.

SECRETARY OF STATE: in the English government, an ancient and important office, concerned in direction of home and foreign affairs. The oldest record of its existence is in the reign of Henry III. 'secretarius noster.' Prior to the Restoration, the holder of this office was generally styled the 'king's chief' or 'principal secretary.' Two secretaries were appointed in later times.

There are now five principal secretaries of state, respectively appointed for home affairs, foreign affairs, war, the colonies, and India. They all are appointed by the sovereign, and are always members of the privy council and of the cabinet. Though each has his own department, he is considered capable of discharging the duties of the others.—The Sec. of State for the Home Department has charge of maintenance of the internal peace and the administration of justice, so far as the royal prerogative is involved. He directs the disposal and employment of the regular and other troops at home, and provides for suppression of riots. He has ultimate supervision of prisons and criminals; and statutory powers regarding police, sanitary matters, regulation of labor, etc. All patents, licenses, dispensations, charters of incorporation, commissions of the peace and of in-

quiry, pass through his office; and he is empowered to grant certificates of Naturalization (q.v.) to foreigners. He is the organ of communication between the cabinet and the viceregal govt. of Ireland. His patronage is considerable, including nomination to a large number of judicial offices.—The Sec. of State for Foreign Affairs is the responsible adviser of the crown in all communications between the govt. and foreign powers. He negotiates treaties, either directly with the foreign ministers resident in the country, or through the British ministers abroad. He grants Passports (q.v.); and it is his duty to inquire into the complaints of British subjects residing in foreign countries, to afford them protection, and to demand redress for their grievances. He recommends to the sovereign all ambassadors, ministers, and consuls.—The Secretary for the Colonial Department has supervision of the laws and customs of the colonies, directs their government, apportions the troops necessary for their defense or police, appoints the governors of the colonies; and sanctions or disallows the measures of the colonial governments, rarely, however, prescribing measures for their adoption.—The Secretary of State for India has control over the govt. of India, and countersigns all warrants and orders relating to India. He is assisted by under-secretaries, etc., also by a council of 15 members.—There is also a Chief Secretary for Ireland, resident in Dublin, except during the sitting of parliament, and under the authority of the lord-lieutenant. The Secretary of State for War (see SECRETARY-AT-WAR) has superintendence of all matters connected with the army, assisted by the commander-in-chief, and is responsible for the amount of the military establishment.

See SECRETARIES OF EXECUTIVE DEPARTMENTS, in the U. S. Government.

SECRETARY OF THE NAVY: in Britain, conventional title of the parliamentary sec. to the Board of Admiralty, a ministerial supporter in the house of commons, usually the exponent of naval policy. He changes with the ministry, of which he is a subordinate member. There is also a permanent secretary, who holds office for life, responsible for the discipline of the Admiralty Office.—See SECRETARIES OF EXECUTIVE DEPARTMENTS, in the U. S. Government.

SECRETARY OF THE SENATE: official, elected by the U. S. senate, who keeps the journal of the senate, communicates to the president and to the other house of congress messages from the senate, and performs other functions of a secretary.

SECRETE, v. *sē-krēt'* [F. *sécréter*, to secrete: L. *secrētus*, severed, separated (see SECRET)]: to conceal; to remove from observation, or from the knowledge of others; in *animals*, to separate or produce from the

blood, or its constituents, substances different from the blood itself; in *plants,* to separate substances from the sap. SECRE'TING, imp. SECRE'TED, pp. SECRETION, n. *sĕ-krē'shŭn* [F.—L.]: the process by which substances are separated from the blood or its constituents, different from the blood itself, as saliva, bile, urine, etc.; one of the substances thus separated (see below). SECRETITIOUS, a. *sē'krĕ-tĭsh'ŭs,* formed by secretion. SECRETIVE, a. *sĕ-krē'tĭv,* causing secretion; inducing secrecy or concealment. SECRE'TIVELY, ad. *-lĭ.* SECRE'TIVENESS, n. *-nĕs,* the quality of being secretive; in *phren.,* the quality of that organ whose large development is said to impel the individual toward secrecy or concealment. SECRETORY, a. *sĕ-krē'tō-rĭ,* performing the office of secretion.—SYN. of 'secrete': to hide; conceal; cover; screen; shelter; separate.

SECRE'TION, in Physiology: process of *separation* from the fluids of the body of those matters destined not to be directly applied to nutrition and renovation of its organized fabric, but (1) to be either at once removed as injurious to its welfare, or (2) to be employed for some ulterior purpose in the chemical or physical processes of the economy itself, or to exert some kind of action upon other beings. The term is also commonly used in another sense—to designate the *products* thus secreted: in this latter sense, it is customary to speak of the biliary, urinary, or cutaneous secretion, when the bile, urine, and sweat are indicated. The process described under (1) is more properly called *excretion,* though it is not always possible to distinguish secretion from excretion.

The organs which yield the various secretions are termed Glands; but neither the form nor the internal arrangement of the parts of a gland have any essential connection with the nature of its product; the true process of secretion, under whatever form, being performed always by the intervention of Cells. For a notice of the mode in which the cells are arranged in various glandular structures, see GLAND: LIVER: KIDNEY: MUCOUS MEMBRANE: ETC.

We briefly note the causes which render due performance of the functions of secretion essential to the well-being of an animal. 1. Nearly all the solids and fluids of the body are liable to continuous decomposition and decay in consequence of their peculiar chemical composition; there is obvious necessity that the products of incipient decomposition should be carried off, and replaced by newly-organized matter. 2. The exercise of the various animal functions is essentially destructive to the structures by which they are accomplished; every operation of the muscular or nervous system appearing to require, as a necessary condition, a disintegration or breaking up of a certain portion of their tissues, probably by an act of oxidation: hence, for due preservation

of health, the disintegrated or effete matters must be removed, and their place supplied. 3. When more food is taken than the wants of the system require, all that is not appropriated to the reparation of the waste, or to the increase in the weight of the body, must be thrown off by the excretory organs without ever having become converted into organic tissue: if this excess were not speedily removed by the excretory organs, the blood would speedily become poisoned. 4. Many of the secretions are essential to a proper performance of the vital processes. The digestive secretions are necessary to effect physical and chemical changes in the food whereby it can be appropriated by the cells of the body and serve for their nutrition. The secretion of the sweat is necessary to assist by its evaporation in preserving the normal temperature of the body. The secretions of certain glands, and as the thyroid gland and the suprarenal glands (called *internal secretions*) are concerned in some way, not as yet fully determined, in maintaining the chemical and nutritive changes, termed metabolism, which are essential to the health and continued existence of the organism.

SECRETIONS, VEGETABLE: any substances formed by action of cells on the compounds taken up as food (such as carbonic acid, water, and ammonia)—whether these substances form part of the tissue of the plant, or are thrown out upon its surface. Thus the term *secretion* has a wider application in the vegetable than in the animal kingdom. All the important vegetable secretions are compounds of carbon, hydrogen, oxygen, and nitrogen; sulphur also being present in some cases; and according to their functions they may be classed in two great divisions—(1) nutritive or assimilable secretions; (2) non-assimilable or special secretions.

1. The *nutritive* secretions are those substances which, having been formed within the plant, are used in forming its structures and constructing its general mass. The chief substances in this class are cellulose, the varieties of starch, the varieties of sugar, the oils, and the so-called protein or albuminous bodies. The composition of these substances is extremely varied; thus, many of the volatile oils or essences contain only carbon and hydrogen; the sugars, starches, and cellulose contain carbon, hydrogen, and oxygen, and are named ternary compounds; while the protein bodies contain carbon, hydrogen, oxygen, and nitrogen, and, in some cases, sulphur.

2. The *non-assimilable* secretions are found only in certain parts of the plant, and are named from their never being converted into the nutritive secretions. The principal members of this class are the coloring matter of plants (chlorophyl and its modifications); the substances which, when extracted from plants, are of service as dye-stuffs (the *chromogens* or color-formers of recent chemists); the organic acids—a somewhat numerous

group, of which oxalic acid (occurring in rhubarb, sorrel, etc.), tartaric and racemic acids (in the grape), malic acid (in the apple and gooseberry), citric acid (in the orange, lemon, lime, and red currant), gallic acid (in the seeds of the mango), meconic acid (in the opium poppy), and tannic acid (in the bark of the oak, elm, etc.), are examples; the vegetable alkalies or alkaloids, e.g., morphia, strychnia, quinia, etc.; the volatile oils; and the resins.

SECRET SERVICE, under the U. S. Government, a dept. conducted by detective officers who watch for counterfeiters, parties endeavoring to evade the revenue laws, and people secretly plotting against the peace and welfare of society. Though not directly established by law, the secret service is well organized and is very efficient. The chief is under control of the solicitor of the treasury. During the civil war a secret service force was employed by the war department. The chief of the bureau had the rank of brigadier-general of volunteers.

While certain trained secret service officers are detailed for this work, others are stationed in foreign countries, and a number of so-called revenue officers are constantly engaged in Kentucky, Indiana, Tennessee and other states, detecting the illicit distilling of liquor and bringing moonshiners to justice. The bulk of the work of the bureau, however, is the detection and punishment of counterfeiters. The advantage lies first with the lawbreaker. He plans and works in secret for months and sometimes years; then stealthily, through trusted channels, the product of his labor is marketed and bad money is quickly turned into good. But work as he may, some imperfection in his spurious bills which has escaped him one day arrests the glance of the keen-eyed money handler. Familiarity with the characteristics of genuine money results in the involuntary detection of a counterfeit. In the investigations made by the division, the chief has constantly before him the exhaustive daily reports of each man in the service, and a careful weighing of the various points submitted by operatives working often at widely separated localities will frequently suggest a move in the right direction. The gravity of the crime makes progress slow, for no step is taken till facts are established to warrant it. It is always considered desirable to so arrange the final act in this drama that the criminal may be taken wholly by surprise. There is a sort of momentary paralysis following the shock of sudden disaster, and when a raid is properly planned the chances of serious resistance are minimized. Occasionally it happens that it becomes necessary for a deal to be made directly with the handlers of spurious money, and in these cases it takes a man of nerve and keen wit to bring it to a successful issue. Such transactions are always fraught with great personal danger.

SECRET WRITING—Sympathetic Ink: see Ink.

SECROLE, *sē-krōl':* small town of Brit. India, N. W. Provinces, 3 m. n.w. of Benares; containing most of the civil establishments, the military cantonments, and the residences of most of the Brit. population connected with Benares. The residences or bungalows are handsome and substantial, but are scattered about among the groves and gardens surrounding the military cantonments, which have capacity for three or four regiments. Among public buildings are a Christian church and chapel, a court of justice, the treasury, the jail, and a mint.

SECT, n. *sĕkt* [F. *secte*, a sect—from mid. L. *secta*, a following, a suite: L. *secta*, a party, a faction—from *sequi*, to follow: It. *setta*, a following]: a number of persons who, following a teacher or leader, are united by their attachment to some particular doctrines or tenets, usually in religion or philosophy; a body of persons dissenting from an established church. Sectarian, a. *sĕk-tā'rĭ-ăn*, pertaining to or peculiar to a sect: N. one of a sect; a dissenter. Secta'rianize, v. *-īz*, to imbue with sectarian principles or feelings. Secta'rianizing, imp. Secta'rianized, pp. *-īzd*. Secta'rianism, n. *-ĭzm*, dissent from an established church. Sec'tary, n. *-tĕr-ĭ*, one who dissents from an established church.—Syn. of 'sectarian, n.': dissenter; heretic; schismatic; partizan.

SECT, n. *sĕkt* [L. *sectus*, cut, divided—from *secārĕ*, to cut]: in *gard.*, a cutting; in *OE.*, a slip or scion.

SECTILE, a. *sĕk'tĭl* [L. *sectĭlis*, that may be cut—from *seco*, I cut]: that may be sliced, as with a knife—applied to such rocks and minerals as talc, mica, and steatite, which can be cut without breaking or crumbling.

SECTION, n. *sĕk'shŭn* [F. *section*—from L. *sectĭō* or *sectĭōnem*, a cutting; *sectus*, cut—from *seco*, I cut]: act of cutting; a part separated from the rest; a distinct part or portion; a division, as of a book, a country, etc.; a paragraph: in *arch.* (see below): in *geom.*, the line formed by the intersection of two surfaces; the surface formed when a solid body is cut by a plane; in the *United States*, a tract of land of one square mile. Sec'tional, a. *-ăl*, pertaining to a section or distinct part; made up of several distinct parts. Sec'tionally, ad. *-lĭ*. Sec'tor, n. *-tĕr*, *literally*, that which cuts or divides: in *geom.*, the part of a circle between two radii and the intercepted arc of the circumference. Its area is equal to that of a triangle whose base is equal in length to the intercepted arc, and whose perpendicular height is equal to the length of the radius. Sector, in *practical mechanics* (see below). Sec'toral, a. of or pertaining to a sector. Sector of a circle, a part of a circle bounded by two radii and the arc between their extremities. Dip sector, an instrument used for measuring the dip of the horizon.

SEC'TION, in Architecture: delineation of buildings on a vertical plane (as it were, *sliced* down) through any part of them—as a *plan* is the horizontal projection. Sections show thickness of walls, construction of floors, roofs,

etc., and forms and dimensions of every part of the interiors of buildings. They may be used to show also the furniture, drapery, etc., of rooms; these are called furnished sections. All moldings, cornices, etc., are drawn in section or profile, full size, for guidance of the workmen.

SEC'TOR, in Practical Mechanics: mathematical instrument in rough mathematical drawing, for laying down plans, calculating zenith distances, etc. It consists of two strips of wood, ivory, or metal, jointed together like a carpenter's foot-rule. It is absolutely necessary for the correctness of the instrument that the centre of the axle of the joint should be accurately at the inner corner of each slip (as shown in the figure), so that it will always be the vertex of a triangle of which the inner edges (and consequently any of the corresponding pairs of lines drawn from the joint obliquely along the rule) form the two sides. These oblique lines, drawn on both sides of the instrument, and converging from the extremities of the two strips to the centre of the joint, are graduated in different ways, to give, on each limb, a line of equal parts, a scale of chords, scales of sines, tangents, and secants, a line of polygons, etc. (all of which are graduated from the centre of the hinge, which is their zero point), besides a number of common scales on the blank portions of the sector. The special use of this instrument is in the finding of a fourth proportional to three given quantities, and the operation is as follows: If the fourth proportional to 18, 16, and 81 is required, find the graduation indicating 18 on each limb; then obtain by means of a pair of compasses, the length from 0 to 16, and open out the instrument till the two 18 points are as far apart as the distance given by the compasses; then, by measuring with the compasses the distance of the two graduations indicating 81, and applying the compasses to the scale, is obtained the fourth proportional required. Thus this instrument merely supplies a mechanical mode of constructing two similar isosceles triangles, one of which has all its sides, and the other has only its equal sides, given; the other side or base, which is formed by the sector, and read off by aid of the compasses and scale, being, from the very nature of similar triangles, the fourth proportion required. The instrument becomes more inaccurate as the angle formed by the limbs increases. It is said to have been invented by Guido Ubaldi about 1568, though Gaspar Mordente of Antwerp describing it, 1584, attributes its invention to his brother Fabricius, 1554. It was described by several German and English writers in the same century, and again by Galileo, who claimed to have invented it 1604.

Sector.

SECTORIAL, a. *sĕk-tō'rĭ-ăl* [L. *sectus*, cut; *secārĕ*, to cut]: adapted for cutting—said of certain of the teeth.

SECULAR, a. *sĕk'ū-lĕr* [F. *séculaire*, secular—from L. *seculāris*, of or belonging to a generation—from *seculum*, a generation, a hundred years: It. *secolare*]: pertaining to things of the present world; temporal; worldly; in *Rom. Cath. Chh.*, not bound by monastic vows—applied to certain of the clergy, 'secular clergy,' as distinguished from the *regulars*, i.e., the monastic clergy (see CLERGY): in *geol.*, applied to great natural processes, whose results become appreciable only after the lapse of ages; happening or coming once in a century: N. in *OE.*, a layman. SEC'ULARIST, n. *-ĭst*, one who discards all forms of religious worship and religious belief, and directs his attention solely to the objects of this life; one who objects to the introduction of a religious element into scholastic or civil life. SEC'ULARLY, ad. *-lĭ*. SEC'ULARNESS, n. *-nĕs*, the quality of being secular. SEC'ULAR'ITY, n. *-lăr'ĭ-tĭ*, worldliness; attention to the things of the present life. SECULAR EQUATION, in *astron.*, the numerical expression of the magnitude and period of a secular inequality. SECULAR GAMES, in *anc. Rome*, games celebrated once in each *seculum*—that is, every 100 or 110 years. SECULAR INEQUALITY, in *astron.*, any deviation from the mean motion or mean orbit of a celestial body. SECULAR REFRIGERATION, in *geol.*, the periodical cooling, and consequent consolidation, of the crust of the globe. SEC'ULARIZE, v. *-lĕr-īz*, to convert from spiritual purposes to common use; to render secular; to convert the regular or monastic into the secular. SEC'ULARIZING, imp. SEC'ULARIZED, pp. *-īzd*. SEC'ULARIZA'TION, n. *-ĭ-zā shŭn* [F.—L.]: the act of converting ecclesiastical property into secular.

SEC'ULARISM: system of ethical principles whose advocacy began in England, about 1846, by George Jacob Holyoake (q.v.). The system has a considerable number of adherents.

The Secular is defined as that which pertains to this life, and is treated as a thing apart; as independent of, rather than as necessarily opposed to, any other mode of thought and duty. S., as regards opponents, claims that to ignore is not to deny. As the geometrician ignores chemistry or metaphysics without a thought of denying them, so S., which concerns itself with this world, refuses to be held as conflicting with that 'other-worldliness' which, if demonstrable, must be based on an experience to which S. makes no pretension, and toward which it considers itself to incur no responsibility. S. begins with the proposition that intelligent sincerity is without conscious guilt, even when it is dangerously mistaken. S. takes Free Thought as its central idea; and defines it as the unrestricted application of the powers of the intellect to any subject—the absence of any threat or penalty, legal, spiritual, or social, for the exercise of thought. The Free Thought which S. inculcates, it protests, is not lawless thought, but the judicial action of the understanding. To the conception of Free Thought is necessary also the Free Publication of Opinion. Again, Free Thought that would command respect must be submitted to Free Criticism:

for thought is often foolish, often mischievous; and the right of criticism is the sole protection of the public from error. Free Thought must end in the Free Action of opinion, since he thinks to no purpose whose thought is inapplicable to conduct; and he withholds the sign of his own sincerity who does not unite his thought with action.

S. holds that Skepticism is the pathway to affirmative truth: so far from being a crime, skepticism is scrutiny: so far from being the end, it is the beginning, of inquiry—the first condition for recognition of unknown truth. He who would be master of his own mind must refuse to believe anything until he is compelled to believe it; it being no more safe to keep one's mind open to all notions than to keep one's door open to all comers. Since it is clear that Free Thought may be a nuisance or an outrage, unless Courtesy takes care of it, S. provides that advocacy shall be directed to exposure of error and elucidation of truth, without moral imputation on those whose opinions are controverted: the quality of the thought, and not the motive of it, is the proper and sufficient subject of discussion. S. further imposes on the action of Free Thought the limit that every one shall concede to others the liberty that he claims for himself, and shall permit to others, and shall recognize in each individual, 'liberty of action in all things by which others are neither injured nor damaged.'—In all the foregoing views S. presents no great difference from the familiar forms of cultured and courteous modern skepticism; nor indeed are these views, in many of their essential points, antagonized by a Christianity drawn not from human traditions, but from the Bible—except that a Christian philosopher might ask for information as to who or what is going to 'compel' any man to believe anything so long as the man refuses to believe that thing? Passing from these points, we come to the more distinctively secularist tenets.

S., regarding the one object of all Free Thought as the attainment of truth, finds in the study of nature its immediate sphere of exercise; for it holds that 'nature and human life are the immediate sources of truth and duty, which it most concerns man to master. Therefore respect for this life, respect for pure physical conditions, respect for the moral capacity of human nature, are conditions of secularist belief. S. is not committed to denying that there is other good—it does not meddle with that question; it says, whether there be other good or not, the good of the present life is good, and it is good to seek that good. It holds that the secular is sacred, and seeks "to find that material condition in which it shall be impossible for man to be depraved or poor." It does not say that all things are material, or that there are no spiritual agencies; it does not enter on these propositions, but confines itself to showing that there are material agencies in this life, whatever else there may be, and that these, as far as they can be discovered, are the calculable forces of the world, which cannot be neglected without folly or hurt, and that it is wisdom, mercy, and duty to attend to them.' Here, again, S. as a

practical teaching is not new. Without entering on the question of the interference of Providence, S. contends that Science is practically the providence of life; that conscience is higher than consequence; that deliverance from calamity is more merciful than any system of consolation which only acts when calamity has occurred. S. proceeds in the path of Positive Philosophy. In sacred writ it seeks for thought which commends itself to reason and experience, accepting the intrinsically true, without entering on questions of inspiration or authenticity. 'Whatever principles S. inculcates, they are affirmative in their nature, relate to the welfare of humanity, and are determined by considerations purely human.'

There is unquestionably a vast outlying class in every Christian country who are without the pale of Christianity. They either dislike it, or they do not understand it. S. declares itself intended for these, and for all who find theology indefinite, or inadequate, or deem it unreliable; and it claims to address these classes in their common reason and intelligence, by an appeal to principles of a secular nature, common to humanity in every state and clime. S. is thus claimed to be an argument not against Christianity, but independent of it. It does not question the pretensions of Christianity; it advances others. 'S. does not say there is no light or guidance elsewhere, but maintains that there is light and guidance in secular truth, whose conditions and sanctions exist independently, act independently, and act forever. Secular knowledge is manifestly that kind of knowledge which is founded in this life, which relates to the conduct of this life, conduces to the welfare of this life, and is capable of being tested by the experience of this life.' It is the distinct assertion of S.: 'That which is secular can be tested in time; that which is theological is provable only after death.' This directly contradicts Christianity, which, appealing for its proofs to the history, experience, and observation of man in this world, thus declares that spiritual facts may *now* be tested and known by man.

The standard of S. is utilitarian. Utility is made the test of right, not (it is said) the utility which is sensual and selfish, but that which takes into account the highest attributes and noblest aspirations of humanity (see UTILITARIANISM). It is not the agent's own happiness, but the happiness of others which the utilitarian is bound to promote. In short, S. sets itself forth as the religion of this present life. It may be regarded as the practical part of Positivism—Positivism without its philosophy, its polemic, its ritual, or its attempt at poetic sentiment.

SECUND, a. *sĕk'ŭnd* [L. *secun'dus*, next in the same rank, second—from *sequi*, to follow]: in *bot.*, all turned to one side, as flowers or leaves on a stalk arranged on one side only. SEC'UNDINE, n. *-ŭn-dĭn*, in *bot.*, the second coat of the ovule, lying within the primine; the intine; the fetal membranes collectively.

SECUNDERABAD, *sē-kŭn-der-â-bâd'* (correctly Sikandarâbâd): large town, and important Brit. milit. cantonment in the Nizam's Dominions, India, six m. n. of Haidarâbâd. On the n. e. are two remarkable granite hills, large, hemispherical in shape, isolated, and having on their summits the tombs of Fakirs, which are visited by numerous pilgrims each year. The cantonment consists of a curved, irregular street, three m. in length, with the officers' houses on either side. There are numerous barracks, and good hospital accommodation. The milit. force stationed here 1883 was 5,632, of whom 2,276 were European. There are many tanks in the vicinity, and the water is good. The mean annual temperature is 81° 30′, and the climate is unhealthful—though less so now than formerly—during the rainy season. Pop. about 74,124.

SECUNDIANS, n. *sē-kŭn'dĭ-anz:* in *ehh. hist.*, a Gnostic sect in the 2d c., founded by Secundus, one of the principal followers of Valentinus. He is believed to have maintained that there were two antagonistic first causes, light and darkness, or a prince of good and a prince of evil; views probably derived from Zoroastrianism.

SECUNDUM ARTEM, phrase, *sē-kŭn'dŭm âr'tem:* according to art or rule; scientifically.

SECURE, v. *sĕ-kūr'* [L. *secūrus,* free from danger, secure—from *sĭnĕ,* without; *eura,* care; It. *sicuro*]: to protect; to render safe; to guard, as a prisoner; to put beyond hazard or doubt; to assure; to make certain; to fasten, as a door: ADJ. free from danger, or the apprehension of it; protected; safe; confident; not vigilant; careless. SECU'RING, imp. SECURED' pp. *-kūrd':* ADJ. made certain; made safe. SECU'RER, n. *-kū'rer,* one who secures. SECURE'LY, ad. *-lĭ.* SECU'RITY, n. *-rĭ-tĭ* [F. *sécurité*—from L. *securitātem*]: that which protects or secures; anything given or done as a pledge or guarantee; one who becomes surety for another; protection; confidence of safety; assurance. SECU'RITIES, n. plu. *-tĭz,* bonds, certificates of stocks, and the like, as evidence of debt or property (see BOND: MORTGAGE).—SYN. of 'secure,' a.: safe; confident; careless; undisturbed, easy; certain; sure; assured; inattentive; heedless;—of 'security': defense; guard; shelter; protection; ease; assurance; surety; confidence; pledge; carelessness.

SEDALIA, *sē-dā'lĭ-a:* city, cap. of Pettis co., Mo., on the Missouri Pacific and the Missouri Kansas and Texas railroads; 40 m. s. of Missouri river, 94 m. e. of Kansas City, 189 m. w. of St. Louis. It is on a high and picturesque prairie, in an agricultural and coal region; and owes its prosperity to the railroads that pass through it. It contains the locomotive shops of the Missouri Pacific railroad, and the general offices and car-shops of the Missouri Kansas and Texas railroad. S. is the largest city in Central Missouri. The manufacturing interests, embracing over 130 establishments, include railway

material, iron furnaces, agricultural implements, brewing, woolen products, flour, soap, boots and shoes, overalls, carriages, pork, beef, and poultry packing. There are several large school buildings in S., business colleges, and a college for colored students. There are more than 20 places of worship, a Federal building, several daily and weekly newspapers, theatres, and large banks and business concerns. S. University, St. Joseph's Academy, the George K. Smith College, a city hospital, and a Carnegie library are at S. Steam heating for the city is provided. The electric lighting, water, and gas supply is adequate. The school census of 1904 gives a population of 18,597. The city was founded 1860, was an important milit. post during the civil war, and was the centre of the great railroad strike 1886. Pop. (1900) 15,231.

SEDAN, *seh-dŏng′:* manufacturing town and frontier fortress of France, dept. of Ardennes. Pop. (1901) 19,349. In 1646 Colbert founded here the first of his famous cloth factories; and the fabrics of S. have now a European reputation, and employ many hands. There is also extensive industry in various branches of metallurgy; and there are coal and iron mines in the vicinity. The fortress of S., which had before been prominent in military history, was the scene of the most important battle, and one of the chief French disasters of the Franco-German war (q.v.). 1870, Sep. 2, Emperor Napoleon III., with his army, defeated in a terrific contest, and now shut in by an overpowering German force, capitulated—the emperor, 39 generals, 230 staff-officers, 2,600 officers, and 83,000 men, becoming prisoners of war. Private residences have now taken the place of the old fortifications.

SEDAN, n. *sē-dan′* [from *Sedan,* town in n. France, where first used]: covered portable chair for carrying a single person, borne on poles in the hands of two men. It is said that the Duke of Buckingham used one in the reign of James I., which gave general offense, indicated by the public remark that this royal favorite used his countrymen to do the work of beasts. The general introduction of sedans or sedan chairs into England dates from 1634, about the same period that hackney coaches came into use. Sedans were largely used during the greater part of the 18th c., being found well adapted for transporting persons, in full dress, to public and private entertainments. There were numerous public conveyances of this kind in London and all considerable towns; and the owner of every great mansion had his private sedan handsomely fitted up. In Edinburgh, in the 18th c., sedans were far more numerous than hackney coaches, and were almost all in the hands of Highlanders. Sedans are now seldom used anywhere, except for transport of the sick.

SEDATE, a. *sē-dāt'* [L. *sedātus,* composed, calm; *sedārĕ,* to settle—from *sedērĕ,* to sit: It. *sedato*]: staid; serious; calm; unimpassioned; composed; quiet. SEDATE'LY, ad. *-lĭ.* SEDATE'NESS, n. *-nĕs,* calmness of manner or countenance; composure; tranquillity. SEDATIVE, a. *sĕd'ă-tĭv* [F. *sédatif*]: composing; diminishing or allaying irritability or pain: N. a medicine which produces a soothing effect (see SEDATIVES).—SYN. of 'sedate': composed; tranquil; unruffled; serene; sober; serious; undisturbed; settled; calm; quiet; still; contemplative.

SED'ATIVES: medicines which exert a direct or primary depressing action on the vital powers, without inducing subsequent excitement. The diseases in which sedatives are employed are chiefly those of overexcitement of the nervous and circulating systems; and as some of the members of this class act directly on the nervous system, while others act more immediately on the heart, it is necessary to be able to determine the kind of sedatives suitable for each individual case. The following are among the important sedatives: aconite, carbonic acid (applied locally in cases of irritable bladder or womb, or to painful ulcers), chloroform (especially when inhaled), conium, digitalis, hydrocyanic acid, and tobacco. Some of these are highly dangerous except in cautious professional hands.

SEDDON, RICHARD JOHN: New Zealand premier; b. Eccleston, Lancashire, England, 1845; d. 1906. Emigrating to Australia at 18 he was attracted to New Zealand four years later by the gold discoveries. He sat in the New Zealand parliament in 1879-81 and 1881-90, later became minister for defense and public works, commissioner of trades and customs, and finally rose to be premier. By profession he was a mining engineer, and was an associate of the American Institute of Mining Engineers. He was the body and the soul of the New Zealand government and the most popular head it ever had.

SEDENTARY, a. *sĕd'ĕn-tĕr-ĭ* [F. *sédentaire*—from L. *sedentārĭus,* sedentary—from *sedens* or *seden'tem,* sitting; *sedērĕ,* to sit: It. *sedentario*]: accustomed to pass much time in a sitting posture; requiring much sitting or inactivity, as an employment or profession; inactive; sluggish: N. one of a tribe of spiders called the SED'ENTA'RIA, *-tā'rĭ-a.* SED'ENTARILY, ad. *-ĭ-lĭ.* SED'ENTARINESS, n. *-ĭ-nĕs,* the state or quality of being sedentary. SEDENTARY OCCUPATION, employment which calls for no active physical exertion, usually pursued in a sitting posture.

SEDERUNT, n. *sĕ-dē'rŭnt,* in Scot. *sĕ-dā'rŭnt* [L. *sedērunt,* they sat; *sedērĕ,* to sit]: a sitting: in *Scot.,* the sitting of a court, or other regularly constituted body; the recorded list of the names of the members present at the sitting of meeting.

SEDGE, n. *sĕj* [AS. *secg*, sedge: Low Ger. *segge;* Ir. *seisg;* W. *hesg*, sedge]: water-iris or river-flag; a general name for the grass-like or rush-like plants of the ord. *Cyperāceæ* (see CAREX). SEDGED, a. *sĕjd*, composed of flags or sedge. SEDGY, a. *sĕj'ĭ*, overgrown with sedge.

SEDG'WICK, CATHERINE MARIA: author: 1789, Dec. 28—1867, July 31; b. Stockbridge, Mass.; daughter of Judge Theodore Sedgwick, LL.D. At her father's death 1813, Miss Sedgwick established a school for young ladies, which she continued with great success for half a century. In 1822, she published *A New England Tale*, followed 1824 by *Ridwood*, a novel, so popular that it was reprinted in England, and translated into several European languages. This was followed by *Hope Leslie, or Early Times in America* (1827); *Clarence, a Tale of Our Own Times* (1830); *Le Bossu* and *The Linwoods* (1835), considered the best of her stories; and these by a series of popular stories, illustrating morals and domestic economy, entitled *The Poor Rich Man and the Rich Poor Man, Live and Let Live, Means and Ends, Home*, etc. Miss Sedgwick contributed 'Life of Lucretia Maria Davidson,' to Sparks's *American Biographies*. In 1841, on her return from Europe, she published *Letters from Abroad to Kindred at Home;* in 1845, *Wilton Harvey and Other Tales;* followed by *The Morals of Manners*, and *Married and Single*. She also edited, and was an active contributor to some of the leading periodicals. She died near Roxbury, Mass.

SEDG'WICK, JOHN: soldier: 1813, Sep. 13—1864, May 9; b. Cornwall, Conn. He graduated from West Point 1837; served in the Seminole war and on the Canada border; was in the principal battles of the Mexican war, and was twice brevetted for gallant conduct. In the civil war he was at the siege of Yorktown; rendered valuable service at the battles of Fair Oaks, Savage Station, Glendale, and Antietam, and in the latter engagement received three wounds which disabled him for several months. He took the heights of Fredericksburg, had a brilliant part in the battle of Gettysburg after one of the hardest forced marches on record, and exhibited remarkable skill in capturing a division of Confederate troops, with their arms and flags, at the crossing of the Rapidan 1863, Nov. 7; was in the thickest fight in the battles of the Wilderness, and while arranging the positions of the artillery at Spottsylvania Court-House was instantly killed by a rifle ball fired by a sharpshooter. He was promoted colonel U. S. army 1861, Apr.; brigadier-general volunteers 1861, Aug; major-general volunteers 1862, July 4; and was offered, but declined, the command of the Army of the Potomac. He was highly respected and, though a strict disciplinarian, was one of the most popular officers in the army. A fine statue, made of cannon captured by his troops, was placed at West Point 1868.

SEDG'WICK, ROBERT: soldier: about 1590-1656, May 24; b. England. He had been connected with a London artillery company, removed to Charlestown, Mass., 1635; engaged in mercantile affairs and accumulated considerable property, and was a member of the general court for several years. He was prominent in founding the Ancient and Honorable Artillery Company (Boston 1638), and two years later became its captain. He was commander of the castle 1641, colonel of a regiment 1643, and commander of the state militia 1652; was engaged by Cromwell against the French at Penobscot 1654, and the Spanish W. I. 1655; and Cromwell promoted him major-general and appointed him governor of Jamaica shortly before his death. With John Winthrop, Jr., Sedgwick established 1643-4 the first ironworks in this country.

SEDG'WICK, THEODORE, LL.D.: statesman and jurist: 1746, May—1813, Jan. 24; b. Hartford, Conn.; descendant of Maj.gen. Robert Sedgwick (q.v.). Educated at Yale College, he studied divinity, but turned to the legal profession 1766, and removed to w. Mass., where he was a member of the colonial assembly. He practiced law in Great Barrington, and afterward in Sheffield. Though a loyalist in feeling at the outbreak of the American revolution, he ardently took the part of his country, and served as aide-de-camp to Gen. Thomas in the unfortunate expedition to Canada 1776. In 1785, he settled at Stockbridge, Mass., where his descendants now reside; was a member of the continental congress 1785-6, and was active in suppressing Shays's rebellion. He remained in congress as representative 1789-96, and as senator 1796-99, acting as president of the senate 1797. He was again in the house of representatives 1799, and was chosen speaker. In 1802 he was appointed judge of the supreme court of Mass. Sedgwick was a prominent member of the old federalist party, and an early and open opponent of slavery. He died at Boston.

SEDG'WICK, THEODORE: lawyer and writer: 1780, Dec. 31—1839, Nov. 7; b. Sheffield, Mass.; son of Judge Theodore Sedgwick, LL.D. (1746-1813). He was bred to the legal profession, and 1801 settled at Albany, New York, where he remained in successful practice until 1821, when he retired to Stockbridge, Mass., advocating, as a popular speaker, the interests of scientific agriculture, free trade, temperance, and anti-slavery. He wrote *Public and Private Economy, illustrated by Observations made in Europe in 1836-7* (3 vols., 12mo, New York 1838). He died of a stroke of paralysis, after making a public speech in a democratic meeting at Pittsfield, Mass.—SUSAN RIDLEY SEDGWICK (about 1789-1867), his wife, descended from an old English Border family, and proud of her relationship to Bp. Ridley, was a daughter of William Livingston, gov. of N. J. She was author of *The Morals of Pleasure* (1829); *The Young*

Emigrants, and *The Children's Week* (1830); *Allan Prescott*, a novel (1834); *Alida* (1844); and *Walter Thornby*, a novel, written 1859, when she was more than 70 years old.

SEDG'WICK, THEODORE: lawyer and writer: 1811, Jan. 27—1859, Dec. 9; b. Albany, N. Y.; son of the second Theodore Sedgwick (1780-1839). He was educated at Columbia College, and admitted to the bar 1833; and excepting three years spent at Paris, as secretary of the American legation, continued in successful legal practice until 1850, when he made an extensive tour in Europe. He steadily declined to engage in politics, and refused high offices tendered him, until 1858, he accepted that of U. S. attorney for the s. district of N. Y. Among his writings are, a standard *Treatise on the Measure of Damages;* a work on *The Interpretation and Application of Statutory and Constitutional Law;* the *Memoirs of William Livingston*, his grandfather; *The Life and Works of William Leggett*, and various occasional addresses. He died at Stockbridge, Mass.

SEDILLA, n. plu. *sĕ-dĭ'lĭ-ă* [L. *sedīlĕ*, a seat, a chair —from *sedērĕ*, to sit]: seats; used in ecclesiastical language for certain seats in many churches set apart for the priests.

SEDIMENT, n. *sĕd'ĭ-mĕnt* [F. *sédiment*—from L. *sedimen'tum*, a settling down, a subsidence—from *sedērĕ*, to sit, to settle: It. *sedimento*]: the matter which subsides or settles at the bottom of a liquid; lees; dregs. SED'IMENT'ARY, a. *-mĕnt'ĕr-ĭ*, pertaining to sediment, or consisting of it. SEDIMENTARY ROCKS, rocks that have been formed by the depositions of materials that had been held in suspension by water.

SEDITION, n. *sĕ-dĭsh'ŭn* [F. *sédition*—from L. *seditĭō* or *seditĭōnem*, civil discord—from *se*, aside; *itĭō*, a going —from *īrĕ*, to go: It. *sedizone*]: tumultuous rising of men against law and order, of a local character, and less than an insurrection: in *law*, offenses against the state which fall short of treason—e.g., writing, publishing, or uttering words that might excite to treason or an insurrection. Sedition differs from treason in not being an act of direct and open violence against the laws, or of subversion of the constitution: it is punishable as a revolt against legitimate authority. SEDI'TIOUS, a. *-ŭs*, pertaining to sedition; tending to excite opposition to law or lawful authority; turbulent; factious. SEDI'TIOUSLY, ad. *-lĭ*. SEDI'TIOUSNESS, n. *-nĕs*, the quality of being seditious; the disposition to excite, or the act of exciting, popular disturbances in opposition to law.—SYN. of 'sedition': insurrection; revolt; tumult; mutiny; rebellion; uproar; riot; revolution.

SEDRAT, n. *sĕd'rāt* [Ar.]: in *Moham. myth.*, the lotus-tree standing on the right-hand side of the invisible throne of Ali, with two rivers running from its roots.

Its boughs extend further than the distance between heaven and earth.

SEDUCE, v. *sĕ-dūs'* [L. *seducĕrĕ,* to lead aside, to separate—from *se,* aside; *ducĕrĕ,* to lead]: to entice from the path of rectitude, duty, or virtue, by flattery, bribes, promises, or otherwise; to lead astray; to corrupt; to deprave; to persuade to a surrender of chastity. SEDU'CING, imp.: ADJ. having a tendency to seduce; enticing; alluring. SEDU'CINGLY, ad. *-lĭ.* SEDUCED', pp. *-dūst.* SEDU'CER, n. *-sĕr,* one who leads astray; one who leads a female from the path of virtue. SEDUCE'MENT, n. *-dūs'-mĕnt,* the means or arts employed to seduce. SEDUCTION, n. *sĕ-dŭk'shŭn* [F.—L.]: the act or crime of persuading a female to surrender her chastity; the means of leading astray. SEDUC'TIVE, a. *-tĭv,* tending to lead astray; enticing. SEDUC'TIVELY, ad. *-lĭ.*—SYN. of 'seduce': to entice; allure; inveigle; decoy; tempt; attract; mislead.

SEDUCTION, in Law: act of a man who induces a woman to unlawful sexual intercourse with him. Formerly in some of the states, and still in England, seduction is not a criminal offense, unless involving the crime of Abduction or of Rape, or unless the woman is of an age under the age of consent; but several of the states have now made seduction a crime, by statute. Where such statutes do not exist, the woman has at common law no action for damages for seduction unaccompanied by force or assault; though in many cases the same object is reached through suit for breach of promise of marriage. But the parent, or guardian, or any one to whom the woman can be showed to owe *service,* has right of action for loss of her services in case of such loss; and this right continues after a girl's majority if her duty of service remains. Though loss of services is the technical basis for the action, yet when that has been duly established, juries may, and usually do, give damages in some degree commensurate with the real injury wrought.

SEDULOUS, a. *sĕd'ū-lŭs* [L. *sed'ŭlus,* diligent, zealous—from *sedērĕ,* to sit]: diligent and persevering in any pursuit; laborious; industrious; unremitting. SED'ULOUSLY, ad. *-lĭ.* SED'ULOUSNESS, n. *-nĕs,* or SEDULITY, n. *sĕ-dū'lĭ-tĭ* [L. *sedulĭtas*]: the quality of being sedulous; steady diligence; diligent and assiduous application in any pursuit.—SYN. of 'sedulous': industrious; diligent; assiduous, laborious; unremitting.

SEDUM, *sē'dŭm:* genus of plants of nat. order *Crassulaceæ,* having the calyx in 4—8 (usually 5) deep segments, which often resemble the leaves, the same number of spreading petals, twice as many stamens, and 4—8 (usually 5) germens, each with a nectariferous scale at the base. The species are numerous, with succulent, often roundish leaves; and pretty, star-like flowers. Many grow on rocks, whence the English name STONE-CROP.

They are natives of temperate and cold parts of the n. hemisphere. They have no important uses; some are refrigerant, others are acrid. *S. Telephium,* popularly called ORPINE, is sometimes used as a diuretic; *S. acre* is a common species, whose brilliant yellow flowers adorn the tops of old walls, the débris around quarries, etc. Various species are much used in ornamental planting and window-gardens. Our native species include the Three-leaved Sedum (*S. ternatum*), the Wild Orpine (*S. telephioides*) of mountain rocks, and the Beautiful Sedum (*S. pulchellum*); none of them n. of Pennsylvania.

SEE, v. *sē* [AS. *seon;* Goth. *saihvan;* Dan. *see;* Ger. *sehen,* to see]: to perceive by the eye; to have the power of sight; to behold; to observe; to discover; to view; to understand; to know; to visit, as friends; to escort; to attend, followed by *to;* to experience. SEE'ING, imp. perceiving by the eye; understanding: N. sight; vision: CONJ. since; it being so; because that. SAW, pt. *saw,* did see. SEEN, pp. *sēn,* beheld; observed. SEE, int. *impera.* form of the verb *see;* lo! look! behold! SEER, n. *sē'r,* one who sees, used in composition, as a *sight-seer;* a person who can foresee future events; a prophet. SEERESS, n. fem. *sēr'ĕs,* a prophetess. SEE TO IT, look well to it; beware. LET ME SEE, or LET US SEE, phrases expressive of particular consideration of the subject under notice. TO SEE ABOUT A THING, to pay attention to it; to consider it.—SYN. of 'see': to behold; look; view; contemplate; regard; eye; perceive; scan; observe; descry; discern; distinguish; understand; comprehend; visit; feel; experience.

SEE, n. *sē* [OF. *sé, sed,* the seat or throne of a bishop —from L. *sēdēs,* a seat—from *sedērĕ,* to sit]: the seat of episcopal power; the jurisdiction of an archbishop or a bishop; a diocese; the authority of the pope or court of Rome; in *OE.,* a throne. See, in ecclesiastical use, properly signifies the seat or chair (*cathedra*), sometimes called 'throne,' of a bishop. By universal usage, however, see designates the city (thence, at least in popular language, the entire diocese) in which the seat of the bishop is placed. Sees have, as a rule, been in some city, or considerable town; and in general the name of a see is taken not from the district governed by the bishop, but from the city or town. To this usage, the names of most of the Protestant Episcopal sees in America are an exception. Sees *In Partibus Infidelium* still retain their ancient names, though in many cases not merely the cities themselves, but even all traces of the Christian religion, in the sites on which they anciently stood, have disappeared. In the Roman Church, the pope alone establishes sees, and alters their distribution and their local limits and boundaries; though these changes are not made except in extreme cases (e.g., the French Revolution) without consent of the actual bishop. In the

Anglican Church, this is done by authority of parliament. In the Protestant Episcopal Church in America sees are created, and limits of diocese changed, by authority of the gen. convention.

SEE, HORACE: American naval engineer; b. Philadelphia 1835, July 17. He received his training as a mechanical engineer in a machine shop. As superintendent engineer of the firm of William Cramp & Sons he was identified with its fame as the builder of high-class ships. He is known as the inventor of the hydro-pneumatic ash ejector, the cylindrical mandrel for face bearings, and other important mechanical devices, including a double furnace water tube boiler and a pneumatic siphon fire hydrant. He is consulting engineer and naval architect for several noted corporations in the United States. He was a private in the Gray Reserves in the early part of the Civil War; became corporal of the 7th regiment of Pennsylvania militia in Maryland, 1862; was adjutant of the 20th regiment of Pennsylvania National Guard during the July riots, 1877; and subsequently became captain of the 1st regiment of Pennsylvania National Guard.

SEE, THOMAS JEFFERSON JACKSON: American astronomer; b. near Montgomery City, Mo., 1866, Feb. 19. He was graduated at the University of Missouri in 1889 and studied at Berlin until 1892. He aided in the organization of the Yerkes Observatory of the University of Chicago in 1893-6; participated in the observations of the Lowell Observatory in 1896-8 during the survey of the zone between 15° and 65° of the Southern heavens, resulting in the discovery of new double stars and the re-measurement of old ones; was professor in the United States Naval Academy in 1899-1902, and later, attached to the Naval Observatory.

Among his published works are: *Die Entwickelung der Dopplestern Systeme* (Berlin 1893); *Researches on the Evolution of the Stellar Systems* (Vol. 1., Lynn, 1896); *Researches on the Physical Constitution and Rigidity of the Heavenly Bodies* (Astron. Nachr., Kiel, 1905-6); *The Cause of Earthquakes, Mountain Formation and Kindred Phenomena Connected with the Physics of the Earth* (1907).

SEE-ADDER: an English name for a marine Stickleback.

SEEBOHM, FREDERIC: English economic historian: b. 1833. He was educated at Edinburgh and at Cambridge. In 1856 he became a barrister of the Middle Temple, but has devoted much of his attention to the study of the social organization of the Saxon, Celtic and early English tribes, and has published: *The English Village Community* (1883-90); *Tribal Custom in Anglo-Saxon Law; Tribal System of Wales; The Oxford Reformers; Colet, Erasmus and More; The Era of the Protestant Reformation.*

SEED, n. *sēd* [AS. *sæd*; Ger. *saat*; Dut. *zaad*; Dan. *sæd*; Icel. *sad*, seed]: that part of a plant which contains the rudiment or embryo of the future plant (see below): peculiar secretion in animals by which the ova are fertilized; that from which anything springs; semen; offspring; descendants; race generation; birth; first principle: V. to grow to maturity and produce seed; to shed seed; to sow; to cover with seed-like ornaments. SEED'ING, imp. SEED'ED, pp.: ADJ. bearing seed; interspersed or covered with seed. SEED'Y, a. *-ĭ*, running to seed, or abounding in it; exhausted; poor; shabbily dressed; worn out—in allusion to the appearance of flowers deprived of their bloom. SEED'INESS, n. *-nĕs*, the state or quality of being shabby or miserable; in slang, condition due to recent intoxication, carelessness in dress, etc. SEED'NESS, n. in *OE.*, seed-time; time of sowing. SEED-BEARING, a. bearing or producing seeds. SEED-BUD, the germ or rudiment of the fruit in embryo. SEED-CAKE, a sweet cake flavored with aromatic seeds. SEED-COAT, in *bot.*, the covering of a seed. SEED-CORN, grain or corn to be used for seed. SEED-DOWN, the down on vegetable seeds. SEED-LAC, lac in a granulated form. SEED-LEAVES, the cotyledons or first leaves of an embryo plant. SEED'LING, n. *-lĭng*, a plant reared from a seed, and not from a layer or bud. SEED-PEARL, the smaller sort of pearls. SEED-PLOT or -PLAT, a portion of ground on which seeds are sown to produce plants for transplanting. SEEDSMAN, n. *sēdz'măn*, a merchant who deals in the seeds of plants. SEED-TIME, the period of the year proper for sowing seed. SEED-VESSEL, in *bot.*, the organ which contains the seeds. SEEDS or GRAINS OF PARADISE, the seeds of the plant *Amōmŭm Melegŭētă*, or Melegueta pepper, an aromatic carminative, ord. *Zin giberācĕæ* or *Scitamin'ĕæ*.

SEED, in Phanerogamous Plants: that part which may in some measure be regarded as corresponding to the perfectly developed impregnated *ovum* of animals, and which is one of the chief structures resulting from the effort made by the plant for the reproduction of its species. It is the perfectly developed Ovule (q.v.), which arises from the wall of the ovary. The essential part of the ovule is the *nucellus*, a group of actual cells from which, eventually, arises the embryo-sac. While one cell of the interior of the nucellus (see OVULE) greatly enlarges, the other cells are forced back; the interior of the nucellus thus becomes a cavity (the embryo sac). Fecundation (q.v.) now taking place by means of a cell from the pollen tube, the primary cell is formed, which grows to form the *embryo*. As the fertilized ovule is developed into the ripe seed, the *foramen* (see OVULE) or *micropyle* closes completely; but its place is commonly marked in ripe seeds by a little cicatrix. In the ripe seed, the integuments of the ovule, more fully developed, form the covering (*spermoderm*); while the *nucellus* is either entirely converted into the Embryo (q.v.), or also into an unorganic cellular mass called the Albumen (q.v.), containing

the various reserve stuffs, and therefore, in an economic view, the most important part of many seeds, as of those of the cereal grasses. The embryo, which in the reproduction of the plant, is the most essential part of the seed, is developed to various degrees in different plants. But in general, the *radicle* may be distinguished in it—the beginning of the root or descending axis of the new plant, and the *glumule* or *pemmule*—the beginning of the stem or ascending axis, as well as the *cotyledon* or cotyledons, provided for nourishment of the new plant in its youngest stage. When the embryo is accompanied with albumen, it is sometimes completely inclosed in it; sometimes it lies at the side of the albumen and sometimes it surrounds the albumen like a ring, or even completely. Sometimes, but rarely, the embryo is not well developed in ripe seeds, so that its parts cannot be distinguished, as in the *Orchideæ* in which it appears as a roundish or oval, uniform, little cellular mass. In germination, the embryo breaks through the covering of the seed, and develops itself into the new plant.

Various Forms of Seeds.

1. Eschscholtzia californica. 2. Corn Blue-bottle (*Centaurea Cyanus*). 3. Oxalis rosea. 4. Opium Poppy (*Papaver somniferum*). 5. Stellaria media. 6. Sweet-william (*Dianthus barbatus*). 7. Foxglove (*Digitalis purpurea*). 8. Saponaria calabrica.

Seeds are either *sessile* or *stalked*. The stalk is of various length, and is formed of the *funiculus* which is analagous to the *umbilical cord* in animals; the place at the base of the seed, by which it is affixed to the inside of the fruit, or to the end of the *funiculus*, usually called *Hilum*, When the seed is perfectly ripe, it has no further need of connection with the parent plant, and the *funiculus* dries up, leaving the *hilum* a mere scar.

Besides being inclosed in a capsule, or in a succulent fruit, etc., the most essential parts of the seed have coverings of their own, reckoned as belonging to the seed itself. Its general covering is called the *spermoderm* (Gr. *sperma*, seed, *derma*, covering), which consists of an external membrane, the *testa* (Gr. shell) or *episperm* (Gr. *epi*, upon) and an internal membrane, the *endopleura* (Gr. *endon*, within, *pleura*, side). Sometimes there is within the episperm a fleshy layer, called the *sarcosperm* (Gr. *sarx*, flesh). The Aril (q.v.) is a comparatively rare additional covering.

The seeds of phanerogamous plants afford characters which distinguish two great classes as *Monocotyledonous*

and *Dicotyledonous* (see COTYLEDON). Very few plants have more than two cotyledons (seed-lobes): however, some of the *Coniferæ* have more than two. Cryptogamous plants are designated also *Acotyledonous*, as having no seed-lobes; and the name *Spore* (q.v.) is given to their seeds distinctively.

The power of a seed to sprout, start to grow, or germinate, is spoken of as its viability or vitality. The time during which vitality is retained varies greatly with seeds of different classes of plants, and with the conditions under which they are kept. When deeply buried in the soil they sometimes retain power of germination for a long period, and the appearance of fireweed after a forest has been cleared and the ground burned over, has been taken as an indication that only shallow covering was required to preserve seed for at least a century, though this change in the character of the vegetation may possibly be otherwise explained. Many plants become weed pests owing to the lasting viability of their seeds when buried. There is no reason to suppose that the reputed growth of wheat taken from Egyptian mummies has any foundation in fact, and the stories regarding the growth of maize taken from the tombs of the Peruvian Incas are equally open to doubt. The loss of the natural moisture of seed caused by excessive drying; very low or very high temperatures; and exposure to air, especially if it is warm and damp, all tend strongly to destroy the vitality of seeds. If properly kept the seeds of most of our staple grains and vegetables retain germinating power 3 to 5 years; though seeds of a few kinds, e.g., onion and parsnip, cannot be depended on more than one year; while a few others, e.g., beet and squash, will grow when 6 to 10 years old. A small proportion of the seeds of many plants will germinate at a considerably greater age than indicated, but it is not large enough to make them profitable for the use of the farmer or gardener.

SEED-GROWING.—Until a comparatively recent period seed-growing was not a separate industry in the United States. In all the early history of the country it was the custom for the farmer or gardener to grow year by year such seeds as he expected to need the following season. To some extent this method is still followed, though since 1850 the special business of seed-growing has assumed immense proportions. It is of utmost importance that the varieties of plants grown for profit be kept true to their names and absolutely pure. Hence the business of seed-growing requires thorough knowledge and careful attention to detail. The use of a single pound of lettuce seed which proved to be of a different variety from the one ordered has involved a market-gardener in a loss of over $1,000; and the damage annually sustained by the farmers and gardeners of this country through the use of impure or deteriorated seed amounts to millions of dollars. Seeds should always be grown from the finest specimens of plants or fruits: neglect of this will result in rapid

deterioration of varieties and disappearance of their most valuable characteristics. Where early maturity is important, seed should be saved from the best of the specimens which ripen earliest in the season. In order to avoid 'mixing' it is necessary, with many classes of plants, to grow different varieties in different fields or in widely separated parts of the same inclosure. Certain soils are especially desirable for certain kinds of plants. Climate, also, exerts potent influence on the character of seeds, and goes far toward determining what varieties the grower in any specified locality can profitably produce. Thus the oat plant reaches full development only in a high altitude. A variety of this grain weighing 44 lbs. per bushel when grown in Scotland, if grown in our middle states three or four years will be reduced to 32 lbs. or less, per bushel, and will be still lighter in yield if grown farther south. This is due to the fact that the crop has been removed from its natural habitat. A few plants, like cauliflower, endive, radish, and spinach, either do not mature well in this country or else yield very little seed: consequently their seed is imported from Europe. Turnip seed is grown mainly at the north, okra at the south, and a large proportion of the seed of the early varieties of cabbage used in the United States is grown on the e. coast of Long Island. On account of its splendid climate and fertile soil, California is likely to become a favorite locality for production of the seed of a large number of our staple plants and of many delicate flowers. Experience, however, now seems to teach that, wherever a crop may be profitably grown for seed, home grown seed, if properly graded, gives greatest returns.

SEED TESTING: the determination of the purity and the viability of seed by natural or artificial means. The purity of seed embraces not only the idea of freedom from weed seeds, seeds of nearly related species, and such things as chaff, bits of stem, dirt, etc., but it also includes the idea of 'trueness to type,' or 'purity of stock,' as the seedsmen term it. This last, however, is generally a matter of seed-growing, the grower being held responsible for the ejection of 'rogues,' or plants which differ from the particular variety in hand. In some cases, for instance with certain varieties of peas, the rogues may be removed by sieves where they are smaller or larger than the type, or by hand-picking where the color as in certain beans indicates a difference. Winnowing is also useful in various cases. The presence of rogues always lowers the value of the sample and careful seed-growers and reputable seedsmen exercise constant vigilance in this respect. It is impossible, however, except with certain species or varieties, to recognize rogues by their seeds. Occasionally rogues are superior to the remainder of the crop; in such cases, when observed in time they may become im-

portant varieties, after due selection and growing by themselves for several years. For the satisfactory testing of purity of stock, samples of seed are grown in the field together with samples known to be pure and due comparisons are made, the conditions of soil, season, etc., being as nearly identical as possible. Trueness to type is far more important to the customer than either freedom from most impurities or a high per cent of germinable seeds, because the impurities can frequently be removed and deficiencies in germination may be adjusted by heavier sowings. Many specialists both in Europe and in America have devoted much time and study to the purity of seed; that is, the freedom from weed seed. Among their popular methods the following are most frequently used. Samples of equal weight are taken from various parts of the bulk and after thorough mixing a sample of this composite is taken. This is weighed and spread upon white paper or glass, and the impurities are picked out by means of forceps, each kind of impurity being placed by itself. Any seed not of the kind examined constitutes an impurity; that is, radish seed would be an impurity in cabbage samples. Each kind of impurity is then weighed and its percentage determined. These percentages vary considerably with the different kinds of plants, cereal and most vegetable seeds being grown under clean cultural methods, and being generally easy to clean, should be nearly if not fully 100 per cent pure; whereas clovers and grasses, being grown without such cultural care, and being much harder to clean without considerable loss of good seed, may often have as much as 25 per cent of impurities. These percentages have been tabulated both in Europe and in America, and form a basis by which the experiment stations of both continents judge samples sent in for inspection. The next operation is the determination of the character of the impurities. If these consist of useful seeds they may not seriously affect the value of the sample; but if noxious weeds are present the sample is condemned, and if 1 per cent or more of ordinary weed seeds is found many specialists condemn the sample. The presence of Canada thistle, cockle, dodder, wild mustard, chess, wild-oats, Russian thistle, or of the bulbs of wild onion or garlic, even in small quantities, is generally sufficient to condemn the sample. These may all be seen with a hand-lens or even, in some cases, with the unassisted eye.

Germination tests are conducted either in soil under glass, out of doors, or in specially constructed germinators, some of which are rather elaborate in order to maintain particular conditions during the test. These devices are seldom used except in the botanical laboratories of agricultural experiment stations. Many of the leading seedsmen devote some of their greenhouse space to the testing of seeds for viability. Their methods are

about as follows: The samples are taken in various ways; but frequently the operator estimates the percentage that from his experience he feels sure will not grow. Then he picks out 100 or 200 seeds that he thinks will germinate and plants them. Upon the basis of the estimate and the actual behavior of the sample planted, he figures the approximate value of the seed. When greenhouses are not available seeds are often sprouted between sheets of damp blotting paper, upon porous saucers, plaster of paris dishes, etc.—methods of value also for the home testing of seeds. Temperatures favorable to the germination of each kind of seed must be maintained; these range from about 45 degrees to 80 degrees or even more. Oat seeds will germinate upon melting ice. Moisture and an adequate supply of air must be given and daily inspection and the romoval of the sprouted seeds are essential. Some seeds germinate in a few hours; others require weeks.

Otherwise seed-testing is more interesting than useful, and it has not the all-importance formerly attributed to it, as, under existing conditions, arbitrary standards can rarely be established, because systematic inspection would be too cumbersome and costly, and because the reputable seedsmen are on the alert to keep their stock up to the highest practical grade without other inspection than that they exercise themselves. With them the price of seed is usually a rather safe index of purity, viability, etc., the higher price, other conditions being equal, indicating the superior quality. Such should be given the preference, especially with grass and clover seeds and such other seeds as are difficult to clean.

For interesting tables, details of methods, descriptions of apparatus, etc., consult various publications of the Division of Botany, and the *Year Books* of the Department of Agriculture; also an epitome of these in the *Cyclopedia of American Horticulture* (New York 1900-2).

SEEK, v. *sēk* [Goth. *sokjan;* Icel. *sækia;* Dan. *söge;* Low Ger. *söken;* Ger. *suchen,* to seek]: to look, search, or inquire for; to endeavor to find or gain; to solicit; to resort or have recourse to; to go to find; to make pursuit. SEEK'ING, imp. SOUGHT, pp. *sawt,* did seek. SEEK'ER, n. *-ėr,* one who seeks. TO SEEK AFTER, to attempt to find or take. TO SEEK FOR, to endeavor to find.

SEELAND, *sē'land,* or ZEALAND (Dan. *Själland*): largest and most important island of Denmark; between the Cattegat and the Baltic; separated by the Sound from Sweden, and by the Great Belt from Füuen. Length 78 m.; extreme breadth 70 m.; 2,672 sq.m. The surface is almost flat; the coasts, rock-bound on the s.e., are indented by bays and fiords, the chief of which is the Roeskilde-Isefiord in the north. Pop., including the 9 small islands, Möen, Samsoe, etc., about 722,000.

SEELEY, *sē'lĭ*, JOHN ROBERT: educator and author: b. London, 1834; d. 1895, Jan. 13. He graduated from Christ's College, Cambridge, 1857; was elected a fellow of the college 1858, and lectured there a little more than two years, when he became assistant classical teacher at the City of London School. In 1863 he became professor of Latin in University College, London; and 1869 professor of modern history at Cambridge University, which position he held till death. He published *Ecce Homo* (1865), which appeared anonymously, attracted wide attention, and passed through several editions; *Natural Religion* (1882); *Greater Greece and Greater Britain* (1887), etc.

SEELY, a. *sēl'ĭ* [AS. *sælig*, happy]: in *OE.*, lucky; happy; foolish; silly; simple.

SEELYE, *sē'lĭ*, JULIUS HAWLEY, D.D., LL.D.: president of Amherst College: b. Bethel, Conn., 1824, Sept. 14; d. 1895, May. He graduated at Amherst 1849, and Auburn Theological Seminary 1852. After a year of study in Germany, he was pastor of the Reformed Dutch Church, Schenectady, N. Y., 1853-58, professor of mental and moral philosophy at Amherst 1858-75, and president of the college 1877-90, resigning on account of ill health, but continuing as lecturer. He served in the U. S. congress 1875-77, not seeking the election, the campaign costing him only one postage-stamp. His position on public questions was that of an independent republican. In 1872 he voyaged around the world, in company with Dr. Edward Hitchcock and Abijah Fitch, delivering in India lectures defending Christianity, attended largely by educated Hindus, and afterward published in their language as well as in Japanese and German, the second English edition has the title, *The Way, the Truth, the Life.* He served on the Massachusetts commission for revising the tax system, the report of which is an important volume; and was long a trustee of several state and educational institutions. As one of the board of visitors dealing with the question of the Andover theology, his stand was nonpartisan, yet conservative. He published numerous baccalaureate and other sermons, and articles in magazines and reviews; translated Schwegler's *History of Philosophy* (1856); published *Christian Missions* (1875); and *Duty* (1891). He also revised Hickok's *Moral Science* and Hickok's *Empirical Psychology.*

SEE'LYE, LAURENS CLARK, D.D., LL.D.: educator: born Bethel, Conn., 1837, Sept. 20. He graduated from Union College 1857; studied theology at Andover Seminary 1857-59, and at the Universities of Berlin and Heidelberg 1860-62; and then traveled in Europe and the East. In 1863 he became pastor of the North Congregational Church, Springfield, Mass.; was professor at Amherst College 1865-73; and 1874 was appointed president of Smith College.

SEEM, v. *sēm* [a secondary application of the OE. *seem*, to become, a sense still apparent in *seemly:* Bav. *zemen;* Ger. *ziemen*, to become, to beseem: Icel. *sæma*, to conform to; *sæmr*, becoming, fit; *stoma*, to beseem]: to appear; to have a semblance; to have the appearance of truth or fact; to pretend; to be specious; to look like. SEEM'ER, n. *-ėr*, in *OE.*, one who or that which carries an appearance. SEEM'ING, imp.: ADJ. in appearance; specious; in *OE.*, fair appearance: N. show; semblance; fair appearances. SEEM'INGLY, ad. *-lĭ*. SEEM'INGNESS, n. *-nĕs*, fair appearance; semblance. SEEM'LY, a. *-lĭ*, becoming; fit: proper; decent; comely: AD. in a decent or proper manner. SEEM'LINESS, n. *-lĭ-nĕs*, the state or quality of being seemly. IT SEEMS, denoting an appearance, but not a reality; used ironically to condemn the thing mentioned; used also as affirmation of fact; it appears to be; as is said.—SYN. of 'seemly': suitable; appropriate; meet; congruous; decent, decorous.

SEEM, v. *sēm:* OE. for BESEEM.

SEEN: pp. of SEE, which see.

SEEP, n. *sēp* [AS. *sipian*, soak]: to soak through pores or interstices; to percolate. SEEP'AGE, n. the act of oozing or percolating, the fluid or moisture that percolates, or the quantity of fluid that so passes.

SEER: see under SEE 1: see also PROPHECY.

SEER, n. *sēr* [*sēr* in various Hindu languages]: a weight in Anglo-India equal (since 1871) to a kilogram.

SEESAW, n. *sē'saw* [an imitative word, expressive of the sounds of the upward and downward motions of a *saw*]: a motion backward and forward, or upward and downward; a reciprocating motion; a play of children, in which two are seated, one on each end of a board balanced on a log of wood, or similar elevation, the board being then made to move alternately up and down; in *whist*, the playing of two partners by which each wins the trick in succession: ADJ. pertaining to a motion up and down, or to and fro: V. to swing or move backward and forward, or to move upward and downward; to move with a vibratory or reciprocating motion. SEE'SAWING, imp. SEE'SAWED, pp. *-sawd.*

SEETHE, v. *sēth* [Icel. *sjoda*, to cook by boiling: Ger. *sieden;* Dan. *syde;* Low Ger. *suddern*, to boil: Scot. *sotter*, to simmer]: to boil; to prepare for food in a hot liquor; to be hot, or very hot; to steep; to soak. SEETH'ING, imp.: ADJ. boiling: N. state of boiling. SEETHED, or SOD, pt. SEETHED, pp. *sēthd*, or SODDEN, pp. *sŏd'dn.*

SEFATIANS, n. *sē-fā'shi-anz* [Ar. *sefat*, qualification, attribute]: a sect of Mohammedans who held that God possessed eternal attributes, and that there was no difference between the 'essential attributes' and the 'attributes of operation.' To these they in process of time added a third category, 'declarative attributes,' by which they understood anthropomorphic expressions—e.g., God's eye, his arm, his hand, etc. They were opposed to the Motazilites (q.v.). They ultimately split into several sects, some of which still exist.

SEG, or SEGG, n. *sĕg* [Icel. *saga*, to cut off or out]: in *Scot.* and *prov. Eng.*, a castrated bull; a bull castrated at his full age.

SE-GAN FOO, *sē-gân' fô:* cap. of the province Shen-see in n.w. China; lat. 34° 17′ n., long. 108° 58′ e. It is next to Pekin in size and importance, nearly 10 m. sq. Its walls successfully resisted siege in the Mohammedan rebellion 1868–70. On the great road from China to central Asia, and the focus of other thoroughfares, it is a centre of commerce and manufacture. The city was founded B.C. 246 by the first universal emperor, Che Hwang-te, and named Kwan-chung; under various names, it was cap. of several dynasties. Its most interesting monument is the Nestorian tablet, a stone slab 7½ ft. high and 3 ft. wide, in the wall of an old temple, discovered 1625; it gives an abstract of vague doctrine, an account of the arrival of the Christian missionary Olopun 635, imperial approval of translated sacred books, reverses under Buddhist ascendency, restoration to favor under Yuen-tsung 713–755—the Chinese inscriptions ending with date of erection 781, and followed by Syriac and Estrangelo characters, giving name of the Nestorian patriarch, of Adam, Bp. of China, etc. The Chinese 'forest of tablets' records 5 dynasties, historical legends, 13 classics, and has a likeness of Confucius.—Pop. about 1,000,000; of whom about 50,000 are Mohammedans.

SEGAR: see CIGAR.

SEGGAR, or SAGGAR: see SAGGER.

SEGGING, n. *sĕg'ĭng* [Scot. (see SAG)]: a disease in oats which stints the leaves and hardens the roots; in *Scot.*, the act of falling down, or state of being sunk.

SEGHOL, n. *sĕg'ŏl:* a Hebrew vowel-point equal to *ĕ* in English. SEGHOLATE, a. *sĕg'ō-lāt*, marked with a seghol.

SEGMENT, n. *sĕg'mĕnt* [F. *segment*—from L. *segmen'tum*, a piece cut off—from *seco*, I cut: It. *segmento*]: a part cut off or divided; one of the sections that many animals, such as worms, are divided into: in *geom.*, part cut off from any figure by a line or a plane; portion cut off from a circle by a line, or from a sphere by a plane: when the angle subtended at the centre of a circle by the segment, and the radius, or when the chord of the segment and its height, are known, the length of the arc of the segment and its area can be determined with as much accuracy as the circumference and area of the whole circle (see SPHERE). *Segment* in *bot.* is the division of a frond. SEGMENT, v. *sĕg-mĕnt'*, to divide or become divided into segments. SEGMENT'ING, imp.: N. the act of splitting into segments or divisions. SEGMENT'ED, pp.: ADJ. divided into segments.

Segmental Arch (from a private house, Cairo).

SEGMENT OF A CIRCLE, in *geom.*, the part of a circle cut off by a chord. SEGMENT OF A SPHERE, the part of a sphere cut off by a plane. SEGMENTAL, a. *sĕg-mĕnt'ăl*, relating to or resembling a segment. SEGMENTAL ORGANS, in *zool.* the excretory organs of segmented animals. SEGMENTATION, n. *sĕg'mĕn-tā'shŭn*, a dividing into segments.

SEGNO, n. *sĕn'yō* [It. *segno*—from L. *signum*, a mark]: in *music*, word, or sign, used in connection with marks of repetition. AL SEGNO, to the sign—a direction to return to the sign. DAL SEGNO, from the sign—the sign :S: being placed over the point where the repetition is to commence.

SEGO, *sā'gō:* town of w. Africa, cap. of the state of Bambarra; on the Niger, here called the Joliba, lat. 13° 5′ n., long 7° w. Its streets are winding, have a breadth of 24 to 26 ft., and are extremely clean. The palace of the king is large enough to accommodate 2,000 men and 500 horses. The houses are of clay and are flat-roofed, and the royal residence differs from the other dwellings only in size. The country in the vicinity is well cultivated, and the town is the seat of considerable traffic. Mungo Park, from whom we derive almost all the knowledge we possess of S., here first beheld the Joliba. Pop. estimated 30,000.

SEGORBE, *sā-gōr'bā:* small town of Spain, in the modern province of Castellon, on the right bank of the Palancia, in a valley renowned for beauty of scenery and amazing fertility; 20 m. n.w. of Murviedro. It stands on a hill between two castles, and contains stately houses, numerous churches, and a cathedral. Brandy-distilling is largely carried on, and there are flour and paper mills. Pop. 8,200.

SEGOVIA, *sā-gō'vē-â:* interesting city of Spain, cap. of the modern province of S. (see CASTILE); on the Eresma, by which it is nearly encircled; 47 m. n.n.w. of Madrid. It occupies the top of a rocky knoll, 3,300 ft. above sea-level; is surrounded by picturesque walls with round towers; and consists of narrow uneven streets, with old, quaint, and stately houses, churches, and convents. The Alcazar, or castle, is perched on the w. extremity of the rocky height, and was originally Moorish, but repaired magnificently 1452-58. The cathedral of S., a noble specimen of florid Gothic, is one of the finest in Spain. Silver, copper, lead, iron, marble, and jasper are found in the mountain districts near by. In this region, wheat, barley, flax, and hemp, grapes, olives, carobs, and chestnuts grow in abundance. Sheep-raising is carried on extensively. S. was a place of importance during the time of the Romans; and was frequently the residence of the kings of Castile and Leon. Charles I. of England lodged at the Alcazar 1623. The town was sacked 1808 by the French, under Frere. Pop. (1900) 14,658. Pop. of province about 160,000.

SEGREGATE, v. *sĕg'rē-gāt* [L. *segrĕgātus*, set apart, separated—from *se*, aside; *gregārĕ*, to collect into a flock—from *grex* or *grĕgem*, a flock: It. *segregare*]: to separate from others; to set apart: ADJ. in *bot.*, separated from each other. SEG'REGATING, imp. SEG'REGATED, pp. SEG'-REGA'TION, n. *-gā'shŭn* [F.—L.]: separation from others; a parting.

SEGUIDILLA, n. *sĕg-ĭ-dēl'ya* [Sp.]: in *mus.*, a lively Spanish dance, similar to the country-dance. The tune is in $\frac{3}{4}$ or $\frac{3}{8}$ time.

SEGUIN, *sĕh-gwĭn'*, F. *sĕh-găng'*, EDOUARD, M.D.: 1812, Jan. 20—1880, Oct. 28; b. Clamecy, France. After a full collegiate education he was instructed in medicine and surgery by Jean Gaspard Itard, on whose recommendation he entered on a life-long investigation of idiocy, as to its causes and the mitigation of its evils. His great work began with the treatment of an idiot boy 1837. Two years later he founded the first school ever opened for idiots. The results of his system soon attracted wide attention. A committee appointed 1844 by the Paris Acad. of Sciences carefully examined his methods and reported that the hitherto insuperable difficulties in imparting instruction to idiots had been removed. Two or three schools in which his plans were followed were opened in the United States. At the close of the revolution of 1848, S. came to this country, visited the schools which had been opened, and aided in establishing others. In 1851 he settled at Portsmouth, O., where, for a while, he practiced medicine; was afterward connected with various schools, some of which he helped to organize; and after a visit to France settled 1859 at Mount Vernon, N. Y., where he practiced medicine till 1863, when he removed to New York. He invented the physiological thermometer and other instruments; was govt. commissioner to the Vienna Exposition 1873; and founded 1879, at New York, the Seguin Physiological School for Feeble-minded Children. Among other works, he published *Traitement moral, Hygiène et Education des Idiots et des autres Enfants arriéres* (1846), which is still the standard work on the subject, *New Facts and Remarks concerning Idiocy* (1869), and *Medical Thermometry and Human Temperature* (1876). He died at New York.

SÉGUR, *sā-gŭr'*: French family, distinguished in arms and letters; of Limousin origin, and known there, it is said, as far back as the 9th c. The first notable member was HENRI FRANÇOIS, Comte de S. (1689–1751), French gen. in the war of the Austrian succession.—His son, PHILIPPE HENRI, Marquis de S. (1724–1801), fought in the Seven Years' War, obtained the dignity *Maréchal de France* 1783, and outlived in his retirement the stormy scenes of the Revolution.—The eldest son of this Philippe Henri was LOUIS PHILIPPE, Comte de S. (1753–1830), a vivid, dashing sort of man, for some years ambassador at the court of St. Petersburg, and a great favorite with Catherine II. Of impressionable fancy, full of enthusiasm for the 'philosophers,' the 'reign of reason,' and the 'new ideas' gen-

erally, he hailed the great Revolution with delight, but took no prominent part in it. His public career during the empire was respectable, but not brilliant: the last act of his life was a eulogium on the revolution of July. As a writer, Ségur has in wonderful perfection the national graces of style and spirit. Among his numerous writings are: *Pensées Politiques* (Par. 1795); *Histoire de Frédéric Guillaume II.* (Par. 1800); *Contes, Fables, Chansons et Vers* (Par. 1801); and *Mémoires ou Souvenirs et Anecdotes* (Par. 1824).—He left two sons, OCTAVE AND PAUL PHILIPPE: the latter (1780-1873) was a general of the first empire, took part in the fatal expedition to Russia 1812, and wrote the story of the campaign, *Histoire de Napoléon et de la Grande Armée pendant l'Année* 1812 (Par. 2 vols. 1824). The work has had immense success, and has been translated into almost all languages of Europe. Other works of the Comte Paul Philippe de Ségur are: *Lettre sur la Campagne du Général Macdonald dans les Grisons* (Par. 1802); *Histoire de Russie et de Pierre le Grand* (1829); *Histoire de Charles VIII.* (1834); *Histoire et Mémoires* (1873).

SEGURA, *sā-gô'râ:* river in s.e. Spain, rising in the Sierra Seca, and, after an e.s.e. course of about 180 m., entering the Mediterranean 27 m. below Orihuela. Ships unload at its mouth.

SEICENTISTI, *sĕ-ĭ-chĕn-tĭs'tĭ:* collective name for Italian authors of the 17th c.—a period of literary decadence, whence the name has come to indicate the low or tasteless in literature.

SEIDL, ANTON: Hungarian composer and musical director: b. Budapest, Hungary, 1850, May 6; d. New York, 1898, Mar. 28. He studied at the Leipsic Conservatory, and later at Budapest under Hans Richter, and by that musician was recommended to Richard Wagner when the latter was preparing for the opening of the Baireuth Festspielhaus. As a consequence he came into intimate association with Wagner and acted as stage-manager during the first season of music dramas there in 1876. In 1878 Seidl became musical stage manager at the Royal Opera House, Vienna, and the next year migrated to Leipsic where he was made conductor. After conducting the Nibelung dramas at London in 1882 he joined a company traveling through Germany, Austria, Hungary, Italy, Belgium and Holland during the seasons of 1883-4, which produced only the Wagner operas. He was made conductor at the Metropolitan Opera House, New York, in 1885, after the death of Dr. Leopold Damrosch, and thenceforth, though he made temporary sojourns in Europe filling musical engagements, he regarded America as his home. His influence upon the development of musical taste in this country was extended. Besides being made conductor of the concerts of the Philharmonic Society he was the organizer of the

popular concerts held during several successive summers at Brighton Beach, near New York.

SEIDLITZ, *sĕd'lĭts,* POWDER: an aperient powder named after Seidlitz or Sedlitz in Bohemia. Seidlitz powders are prepared in two parts, each contained in a separate envelope. The alkaline portion, which is contained in a blue paper, consists of 2 drams of Rochelle salts (tartrate of soda and potash) and 40 grains of bicarbonate of soda; and the acid part, in a white paper, of 35 grains of tartaric acid. In preparing for use, the alkaline portion is dissolved in half a tumbler of water, and the acid part is then added, producing effervescence; and the draught is to be taken while the effervescence is going on. Sometimes a little sulphate of magnesia is added to increase the strength.

SEIGNEURY, n. *sēn'ū-rĭ,* plu. SEIGN'EURIES, *-rĭz* [F. *seigneurie*]: same as SEIGNIORY. See SEIGNIOR.

SEIGNIOR, n. *sēn'yŏr* [F. *seigneur;* It. *signore;* Port. *senhor;* Sp. *señor,* lord, sir, gentleman—from L. *senĭor,* elder; *senex,* old]: a title of honor, or simply a word of address, in s. Europe—represented in Britain and the United States by *Sir* or *Mr.,* in France by *Monsieur,* and in Germany by *Herr.* SEIGNIORIAL, a. *sēn-yōr'ĭ-ăl,* or SEIGNEURIAL, a. *sēn-ūr'ĭ-ăl,* pertaining to the lord of a manor; vested with large powers; independent; manorial. SEIGNIORAGE, or SEIGNORAGE, n. *sēn'yŏr-āj,* a charge levied on bullion brought by private individuals to the mint to be coined, which is effected by giving back rather less in coin than was received in bullion, only sufficient in amount to cover the expense—in England the coinage of bullion is generally done at the public expense, but there is a large seigniorage levied on silver and copper currencies; *formerly,* a specific tax on bullion as well as on silver and copper coinage, forming a branch of the royal revenue; acknowledgment of power; a royalty, especially that derived by an author from the copyright of his works. SEIGN'IORY, or SEIGN'ORY, n. *-ĭ,* a lordship; manorial power or authority; in *Lower Canada,* the right of feudal superiority. GRAND SEIGNIOR, the Sultan of Turkey.

SEINE, *sān:* the metropolitan department of France, completely inclosed by the department of Seine-et-Oise. It is a portion of the former province of L'Ile-de-France, and derives its name from its principal river (see SEINE, river). It is the smallest and the most populous department in the republic; 185 sq.m. From s.e. to n.w. the department is traversed 37 m. by the winding Seine, which receives the navigable Marne at Charenton, and the Bièvre at Paris. The surface is marked by undulations and low hills, the highest, Mont Valérien, only 446 feet above sea-level. The climate is pleasant and healthful. The scenery—of which the woods of Verrières, Meudon, and Saint-Cloud, together with those of Vincennes and Boulogne, transformed into parks, and watered by arti-

ficial rivers and lakes, are perhaps the most striking features—is remarkably pleasing. A network of canals and railways, the latter converging in the capital, affords easy transit in any direction. The soil is calcareous, and in the greater part naturally infertile; but, by the skill of the farmers and gardeners, who obtain abundant manure from the metropolis, the country around Paris and its suburbs has been rendered remarkably productive. The culture of vegetables and fruits for the Paris markets is one of the most important branches of husbandry. Enormous quantities of mushrooms are cultivated in the ancient quarries of Paris near Montrouge. Quarries abound, and are productive. Pop. (1901) 3,669,930.

SEINE (anc. *Sequana*): one of the most important rivers of France, rising near Mont Tasselot, in the middle of the department of Côte-d'Or, and, after leaving the n. boundary of that department, flowing w.n.w. through the departments of Aube, Seine-et-Marne, Seine, Seine-et-Oise, Eure, and Seine-Inférieure, to the English Channel, which it reaches at Havre, after a course of 482 m. A straight line from source to mouth measures 250 m. It passes the towns of Troyes, Méry—where, 350 m. from its mouth, it becomes navigable for small boats—Corbeil, Paris, Elbeuf, Rouen, and Havre. The source is about 1,545 feet above sea-level; but below Paris its current is slow, and its course to Rouen has numerous windings. It is connected by many canals with adjacent river-basins. At Paris, navigation begins for boats drawing 9 or 10 feet; at Poses the tide is met; at Rouen begins sea-navigation. The principal affluents are, from the right, the Aube, Marne, and Oise; from the left, the Yonne, Loing, Essone, and Eure.

SEINE, or SEIN, n. *sēn* [F. *seine*—from L. *sagēna;* Gr. *sagēnē,* a large net]: a large fishing-net: also SEAN. SEINING, n. *sēn'ĭng,* the act of fishing with a large net.

SEINE-ET-MARNE, *sān-ā-mârn':* inland department in n. France, bounded e. by the department of Seine-et-Oise, and forming a portion of that wide basin in the middle of which stands Paris: area 2,275 sq.m. The department is named from its two chief streams, of which the Seine flows through the s. and the Marne through the n. part. There are no mountains, but ridges of low hills separate the fertile and extensive though not deep valleys. Timber is grown in every part: among the forests is that of Fontainebleau. The soil is generally fertile. Of cereals, wheat is the principal crop. Vegetables and fruits are largely grown, and the meadows and pastures, natural and artificial, are extensive and productive. The wines are mediocre, but the grapes for the table, called the *Chasselas de Fontainebleau,* have a European reputation. The river Marne marks the n. limit of the vine. The capital is Melun; and the arrondissements are Melun, Coulommiers, Fontainebleau, Meaux, and Provins. Pop. (1901) 358,325.

SEINE-ET-OISE, *sān-ā-wāz'*: department in n. France, inclosing the metropolitan department of Seine; 2,184 sq.m. The great rivers are the Seine and Oise, with numerous affluents. Extensive plains occupy the s. districts; but in the n. the country has picturesque valleys and great forests. The soil is not in general very fertile; but owing to the vicinity of the capital the amount of produce is great. Among minerals, are several fine varieties of stone and fine clays. In addition to the usual manufactures, which are numerous and extensive, porcelain is largely made at the famous Sèvres factories. The department is divided into the arrondissements of Versailles, Corbeil, Etampes, Mantes, Pontoise, and Rambouillet; and the capital is Versailles. Pop. department (1901) 707,325.

SEINE-INFERIEURE, *sān-ăng-fā-rē-ėr'*: maritime department of France, bounded n.w. by the English Channel, s. by the department of Eure; 2,328 sq.m. The Seine flows through the s. districts; but a number of important though small streams flow n.w. across the department and fall into the Channel. The range of the hills of Caux extend e. to w.; and s. of it are rich pasture-lands, watered by the Seine and its affluents. Manufactures are very largely developed, and in many branches. Husbandry flourishes chiefly in the middle and e. districts. The coasts are of chalk-cliffs, in height 200 to 650 feet. The arrondissements are Dieppe, le Havre, Rouen, Neufchâtel, and Yvetot. The capital, Rouen, communicates with Dieppe by a direct line of railway. Pop. department (1901) 583,883.

SEIRFISH, *sēr'fĭsh* (*Cybium guttatum*): fish of family *Scombridæ*, having finlets, and the sides of the tail keeled, the teeth compressed and sharp. It inhabits the seas of the East Indies, and is one of their most valuable fishes. In size and form it is very similar to the salmon, which its flesh resembles in firmness and flavor, though of white color.

SEISMIC, a. *sīz'mĭk*, or SEIS'MAL, a. *-măl* [Gr. *seismos*, an earthquake—from *seiō*, I shake]: pertaining to an earthquake.

SEISMOGRAPH, or SEISMOMETER: an instrument for recording the period, extent, and direction of each of the vibrations which constitute an earthquake. For a complete seismograph, three distinct sets of apparatus are required: (1) To record horizontal motion; (2) to record vertical motion; and (3) to record time. The horizontal and vertical motions must be written on the same receiver, and if possible side by side, while at the instant at which the time is recorded a mark must be made on the diagram which is being drawn by the seismograph. The first instruments were merely modifications of the SEISMOSCOPE, but successive improvements have been introduced, and the seismograph has been brought to a

high pitch of perfection. Some of the best, if not the best, forms known are in use in the Imperial Observatory at Tokyo, Japan.

SEISMOGRAPHY, n. *siz-mog'ra-fi* [Gr. *seismos,* an earthquake—from *seiō,* I shake; *graphō,* I describe]: a writing about, or a description of, earthquakes. SEISMOGRAPH, n. *sīz'mō-grăf,* an apparatus for registering the shocks and undulatory motions of an earthquake. SEIS'MOGRAPH'IC, a. *-grăf'ĭk,* a term applied to maps or charts constructed to indicate the centers of convulsions, lines of direction, areas of disturbance, and the like. SEISMOLOGY, n. *sīz-mŏl'ō-jĭ* [Gr. *logos,* discourse]: the science of earthquakes. SEISMOM'ETER, n. *-mŏm'ĕ-tėr* [Gr. *metron,* a measure]: an instrument for measuring the duration and force of an earthquake, or of any movement of the ground. SEISMOM'ETRY, n. *-ĕ-trĭ,* the mensuration of certain phenomena of earthquakes.

SEISMOL'OGY: that branch of physical science which is concerned with the study and investigation of the phenomena of earthquakes, their causes and effects, their distribution, and the various circumstances attending their occurrence. Its pursuit is regarded as of the utmost importance to geological and other forms of terrestrial research. Seismology, however, is not limited to the study of earthquakes in the usual restricted sense, but deals with related phenomena occurring under many and differing aspects. According to leading authorities, it should investigate minute movements or tremors of the earth which escape ordinary observation; pulsations of the earth which, by reason of the length of their period, are not noticed; and oscillations, or elevations and subsidences of the earth which slowly alter the relative land and sea levels. Seismology has been developed almost wholly since the beginning of the 19th c., and must still be regarded as in the early stages of its progress; but already it has a great and growing body of materials and of literature, and its possibilities seem to point to the application of the science in practical ways. One of these, it is confidently predicted, will be the warning of dwellers in seismic regions when earthquakes or similar disturbances impend. See EARTHQUAKE.

SEIS'MOSCOPE: the earliest and simplest form of earthquake recorder. The first known was invented by a Chinese named Choko, in 136 A.D., and shows the occurrence and direction of an earthquake by the fall of a column, a principle which was afterward independently adopted in the West. Vessels filled with viscid liquids have been used; the height to which the liquid is washed up the side of the vessel being taken to indicate the intensity, and a line joining the points of maximum motion to denote the direction of an earthquake. Palmieri's seismoscope consists of horizontal tubes turned up at the end, partly filled with mercury. To intensify the motion

of the mercury, small floats of iron are placed on the surface, attached by threads to a pulley provided with indices moving in front of a scale of degrees, whence the intensity may be read off. The direction is determined by the azimuth of the tube giving the maximum indication, several tubes being placed in different azimuths. Pendulum seismoscopes, both swinging and fixed, have also been employed.

SEISTAN, *sās-tân'* (or SISTAN), LAKE OF; or HAMOON LAKE, *hâ-môn'* (anc. *Aria Palus*): large, irregularly shaped, shallow lake or lake-basin in the long-disputed border region between Persia and Afghanistan; bordered with plantations of tamarisk and low trees, and inclosed by the province of Seistan. It is 25 parasangs (a parasang = 3.45 English m.) in length, and 6 to 12 parasangs in breadth. It is difficult to fix accurately the form and position of the lake, but the most recent explorations seem to confirm Gen. Ferrier, who says that it is in lat. about 31°—32° n., and that it lies obliquely from 60° long. in the n. to 59° long. in the s. It was visited 1872 by Major Lovett and Sir Richard Pollock. Of the rivers which feed the lake, none, except the Helmund, contribute any waters during the summer, as they are then diverted for irrigation of the land. The lake, which has no outlet, in time of flood overflows its boundaries, and fertilizes large tracts of country. It is only about 4 feet deep through large portions; and in dry seasons it becomes a mere swamp. It is the remainder from an ancient lake which must have been of great size. Its waters are black and disagreeable to the taste.—Seistan is a corruption of Saghistan—i.e., the country of the saghis, a kind of wood which grows here in abundance.

SEITZ, ANTON: German painter: b. Roth, near Nuremberg, 1829, Jan. 23. He was in early years the pupil of the copperplate engraver F. Wagner; subsequently of Reindel, director of the Art Academy at Nuremberg, and in 1850 began the serious study of painting in Munich under G. Flüggen. In his 50th year he had made some reputation as a painter of small canvases with genre subjects taken from the lives of the bourgeoisie. He executed minute figures with such fineness that he quickly rose to the first place in the Munich school as an artist of this specialty. With keen analysis of character and the strongest power of expression he unites a charming feeling for perspective and chiaroscuro in grouping his characters under the light of an inner room; while his sense of humor is delicate and refreshing. His chief works are: *The Beggar Musician and his Daughter; Policeman and Country Girl; Rustics and the Quack Doctor; The Photographer in the Country;* etc.

SEIZE, v. *sēz* [F. *saisir*, to seize—from mid. L. *sacīrĕ*, to take possession: OHG. *sazzan, sezzan*, to put in possession of]: to take or lay hold on suddenly; to take posses-

sion of without right; to take forcible possession of by legal authority; to put or be in possession; to arrest or capture; to fasten *on* or *upon*. SEIZ'ING, imp. SEIZED, pp. *sēzd*. SEIZ'ER, n. *-ėr*, one who seizes. SEIZ'OR, n. *-ŏr*, in *law*, one who seizes or takes possession. SEIZ'ABLE, a. *-ă-bl*, that may be seized; liable to be seized. SEIZURE, n. *sēzh'ûr*, the act of seizing; the state of being seized; the act of taking forcible possession; the thing taken or seized; capture; act of taking by warrant; grasp; possession. TO BE SEIZED OF, to have possession. SEIZIN, or SEISIN, n. *sēz'ĭn* [F. *saisine*, possession of land]: in *law*, possession, or the act of taking possession, as of land (*Sasine* is the obs. Scotch form). SEIZIN IN FACT or DEED, when there is actual possession. SEIZIN IN LAW, when something is done short of actual possession, but which the law considers possession.—SYN. of 'seize': to grasp; capture; clutch; snatch; catch; apprehend; arrest; take; gripe; fasten; fix.

SEIXAS, GERSHOM MENDES: American patriot and minister: b. New York, 1745, Jan. 14; d. 1816, July 4. He was a son of a refugee from Lisbon who settled in New York about 1730, and choosing the Jewish ministry as his profession in 1766 was placed in charge of the Spanish and Portuguese Synagogue of his native city. On the outbreak of the Revolution he espoused the American cause, closing the synagogue rather than continue it under British rule. While the majority of his people went to Philadelphia he settled in Stratford, Conn., until in 1780 he was asked to organize a synagogue in Philadelphia, the *Mikve Israel*, where he continued to display his patriotic zeal. Owing largely to his efforts on Dec. 23, 1783, a modification in the test clause in the Pennsylvania constitution was made, whereby Jews were subjected to no disqualification for office. After the evacuation of New York in 1784, the old synagogue was reestablished and Seixas resumed his former charge. In 1787 he was appointed one of the trustees of Columbia College, holding the office uninterruptedly until 1815. When Washington was inaugurated in 1789 Seixas was selected as one of the ministers to take part in the ceremonies.

SEJANT, a., or SEJEANT, a. *sē'jănt;* in F. ASSIS [Norm. F. *sejant*, sitting: F. *séant*, sitting; *seoir*, to sit —from L. *sedērĕ*, to sit]: in *her.*, sitting, like a cat, with the forefeet straight. SEJANT RAMPANT, sitting with the forefeet lifted up.

SEJANUS, *sĕ-jā'nŭs*, LUCIUS ÆLIUS: son of a Roman knight, and favorite of Tiberius: b. Vulsinii in Etruria; d. Rome, 31. In 14 A.D. he was made commander of the Prætorian bands, and acquired the confidence of the suspicious Tiberius, to such an extent as to govern him completely; while the servile senate paid complete deference to the powerful favorite. The Prætorian cohorts were

also favorable to him, and there was no obstacle in the way of his attaining the supreme power he aimed at but Drusus, son of Tiberius, and the sons of Germanicus, Drusus and Nero, the nearest of kin to the emperor. Drusus was put out of the way by poison; the latter, with their mother, were banished and thrown into prison, a step which they did not long survive. Several friends of Germanicus were beheaded at the instigation of Sejanus; and when Tiberius finally retired from Rome, and withdrew from the government, Sejanus governed with absolute power, and the senate ordered that the statues erected in his honor should be publicly worshipped. But at the moment of his highest elevation the suspicions of Tiberius were awakened, and his measures were taken so cautiously, that Sejanus suspected nothing until openly accused by the emperor before the senate. He was then imprisoned, condemned to death, and executed on the same day. The historian Tacitus has given a searching and vivid, although possibly a prejudiced, account of the character and intrigues of Sejanus, while his fate is the subject of a tragedy of Ben Jonson's. Consult Jülg, *Vita Lucii Ælii Sejani* (1882).

SEK'AKUL: an African parsnip.

SELAH: a Hebrew word which occurs 71 times in the book of Psalms and three times in the prayer of the prophet Habakkuk (Hab. iii.), and is retained in the English Authorized version of the sacred texts: in the Septuagint version it is represented by the word *diapsalma*. Its signification cannot be definitely ascertained, but commentators interpret it variously as indicating either a pause, or repetition, or the end of a strophe, or playing with full power, or a short recurring symphony, or, finally, a bending of the body in reverence.

SELBY, *sĕl'bĭ:* market-town and river-port in the W. Riding of Yorkshire, England; on the right bank of the Ouse, 12 m. s. of York by railway. The ancient Gothic cross which adorns the market-place, and the character of the architecture of the houses, attest the age of the town. The magnificent parish church, 300 feet long by 60 feet wide, is part of an abbey founded by the Conqueror 1068. The movable bridge across the river offers passage to shipping, and the river is navigable to Selby for vessels of 200 tons. Means of communication by railway and canal are abundant. There are iron and brass foundries, and slips for building river-craft; and the manufactures include sail-cloth, ropes, etc. Pop. (1901) 6,500.

SELCOUTH, a. *sĕl'kôth* [AS. *seld-cuth,* seldom known —from *seld,* seldom; *cuth,* known]: in *OE.,* uncommon; rarely known.

SELDEN, *sĕl'dĕn,* JOHN: illustrious English scholar and lawyer: 1584, Dec. 16—1654, Nov. 30; b. near Worthing, in Sussex. He studied at Hart Hall, Oxford, three years and (1603) became a member of Clifford's Inn,

London, and (1604) of the Inner Temple; and was called to the bar. His great learning began to attract attention, and won for him the friendship of Camden, Usher, Sir Robert Cotton, and other prominent men. Selden wrote his first treatise, *Analecton Anglo-Britannica,* in 1606, on the civil government of Britain previous to the Norman Conquest (published 9 years later). In 1610 appeared his *Jani Anglorum Facies Altera* (English transl. 1683), giving an account of the common and statute law of English Brittany to the death of Henry II.; and 1614, *Titles of Honor,* still an authority on its subject. His work on Semitic mythology, *De Diis Syriis, Syntagmata Duo* (1617), established his European fame as an Oriental scholar. Next year, however, he excited great indignation among the bishops by his *Treatise of Tythes,* aiming to prove that under Christianity tithes are due not by divine right, but solely because the law has imposed them. Selden was assailed with diatribes, and arguments on arguments to which he was not permitted to reply—having been summoned before the privy-council and censured for his book. In 1621 he was imprisoned for advising parliament to repudiate King James's doctrine that their privileges were originally royal grants; 1623, he was elected member for Lancaster; and thereafter till his death, he took a considerable part in public affairs, yet not neglecting scholarly pursuits. Selden's political position is difficult to define. There is no doubt that his sympathy was with the popular cause and the parliament, and that he sincerely opposed the views of the court-party and the king; but Selden was a constitutional lawyer, deriving his ideas of the rights of the subject from the history of the nation, and not from religious zeal or metaphysical considerations. Still, he 'loved his ease,' according to Clarendon, and so let things be done, without protest, of which he did not approve. Personally, he was rather a favorite with King Charles, for his learning and moderation. In 1629 he was committed to the Tower, for his active opposition to the illegal exactions of the court; and remained a prisoner 8 months, when he was released through the favor of Abp. Laud and the lord treasurer; 1640, he was chosen member for the University of Oxford; and now, when the struggle between the king and the nation began to grow fierce, he was occasionally suspected of lacking zeal for popular liberty. He threw the weight of his learning and argument into the scale against the bishops (toward whom, like Milton and other lay-champions of freedom, he felt a peculiarly strong antipathy), when the question came up as to their tenure of seats in parliament; he was one of those who drew up the articles of impeachment against Abp. Laud, though Selden does not appear to have been active in the later proceedings against that prelate; he sat as a lay-member in the Assembly of Divines at Westminster 1643, and perplexed his clerical colleagues sadly.

In 1644 he was elected one of the 12 commissioners of the admiralty; in 1646 the sum of £5,000 was voted to him by parliament, in consideration of his services and sufferings for liberty; in 1647 he was appointed one of the university 'visitors,' and always used his influence to moderate the fanaticism of some of his colleagues. After the execution of Charles (which he disapproved as unlawful and inexpedient), he took little share in public matters. His death occurred in the house of Elizabeth, dowager-countess of Kent, with whom he had long lived in such intimacy that people said they were married. The principal writings of Selden, besides those above mentioned, are: *Marmora Arundelliana* (1629); *De Successionibus in Bond Defuncti secundum Leges Hebræorum* (1634); *De Successione in Pontificatum Hebræorum, Libri Duo* (Leyd. 1638); *De Jure Naturali et Gentium, juxta Disciplinam Hebræorum* (1640), a work more learned than critical (like most of Selden's biblical productions, who thought far too much of the opinions of the Rabbins); *De Anno Civili et Calendario Judaico* (1646); *De synedriis et Præfecturis Hebræorum* (1650 *et seq.*); besides a great variety of posthumous works, of which the most famous, and most valuable, is his *Table-talk* (recorded and published by his amanuensis, Richard Milward, 1689). Selden was highly esteemed by all his great contemporaries, both royalist and parliamentarian, for his integrity, candor, and vast erudition; but his moral courage or enthusiasm was not remarkable (except when tilting at the bishops—*then,* like Erasmus on the monks, he was quite heroic); and, on the whole, as compared with Milton, he occupies the level which Erasmus did in relation to Luther. Selden's works were collected and published at London, 3 folio vols. 1726.

SELDOM, ad. *sĕl'dŭm* [Ger. *selten;* Dut. *zelden;* Dan. *sielden;* Icel. *sjaldan,* seldom; Goth. *sildaleiks,* wonderful]: rarely; not often.

SEL D'OR, *sĕl dōr:* a salt employed in photography, originally to aid in fixing and improving the image on a daguerreotype-plate, recently for toning positive paper-proofs. It is a double hyposulphite of gold and sodium. It is formed when 1 part of chloride of gold in solution is added to 3 parts of hyposulphite of soda, also in solution. The hyposulphite of soda should be always in excess during the mixture, a condition secured by adding the chloride of gold to the hyposulphite of soda, and not *vice versâ.* The salt so formed is precipitated in fine, white, crystalline needles on the addition of alcohol to the above mixed solutions; these are collected on bibulous paper, and gently dried for use. Adulterations in the commercial article, unfortunately common, may be ascertained by precipitating, igniting, and weighing the gold contained in the sample that it is desired to test. Nitric acid free from chlorine will decompose this salt, and precipitate its contained gold in the metallic form.

SELECT, a. *sĕ-lekt'* [L. *selectus*, select; *seligĕrĕ*, to choose—from *se*, aside or apart; *lego*, I choose: Sp. *selecto*, select]: picked; nicely chosen; choice: V. to take by preference from among a number; to choose; to pick out; to call. SELECT'ING, imp. SELECT'ED, pp.: ADJ. chosen from among a number; picked. SELECT'OR, n. *-ėr*, one who selects. SELECT'LY, ad. *-lĭ*. SELECT'NESS, n. *-nĕs*, state of being select or well chosen. SELECTION, n. *sĕ-lĕk'shŭn* [L. *selectĭōnem*]: the act of choosing; things selected; a book with select pieces. SELECT'EDLY, ad. *-lĭ*. SELECT'IVE, a. *-ĭv*, exercising choice in the way of selection. SELECT'MAN, n. in *New England towns*, an officer chosen annually to manage their affairs, provide for the poor, etc. NATURAL SELECTION, that process in nature by which plants and animals best fitted for the conditions in which they are placed survive and spread, while the less fitted die out and disappear.—SYN. of 'selection': choice; option; preference; election; pick.

SELENE, *sē-lē'nē:* Greek name of the goddess of the moon; called also *Mene*, and in Latin *Luna*. Her myth is differently told, but the most common account makes her a daughter of Hyperion and Theia, and sister of Helios (the Sun) and Eos (the Dawn); as sister of Helios, called also *Phoibos* (the Shining One), she had the name *Phœbe;* and latterly was identified with Artemis (see DIANA), though the identification was never exact, as Artemis always retained her reputation for chastity, while Selene had 50 daughters by her lover Endymion, and several by Zeus, one of whom was called *Erse* ('the Dew'), indicating the original physical character of the myth. In art, the two are always distinct. Selene is represented by the poets with long wings and a golden diadem, riding across the heavens in a chariot drawn by two white horses, cows, or mules.

SEL'ENITE: the crystallized or distinctly foliated variety of the mineral gypsum, hydrous calcium sulphate. It is number 2 in the scale of hardness, is flexible, but when broken has a 'fibrous fracture' which consists of two imperfect cleavages. When pure it is colorless and transparent. The cleavage plates have a pearly luster which is characteristic of the clinopinacoid, while the other faces of the crystal are subvitreous. Plates of selenite several feet across and perfectly transparent, are not uncommon, while crystals five feet in length have been found in Utah. Fine large crystals are also found in Italy, France and Switzerland. Limpid crystals of matchless beauty occur in the Sicilian sulphur mines. Twin crystals are common in all these localities, the most typical of which are the 'fish-tail' twins. Foliated selenite is abundant in Nova Scotia, also at Lockport and elsewhere in New York, while crystals of model-like perfection are found near Ellsworth, Ohio. Like massive gypsum, selenite is an exceedingly common mineral. It

has been used to some extent as a filler for paper, paints, etc.

SELENIUM, n. *sĕ-lē'nĭ-ŭm* [Gr. *selēnē*, the moon—akin to *selas*, light]: elementary substance (see below). SELENIC, a. *sélĕn'ĭk*, pertaining to or obtained from selenium—applied to an acid containing one equivalent of selenium and three of oxygen. SELENIATE, n. *sĕ-lē'nĭ-āt*, a salt of selenic acid. SELENIDE, n. *sĕl'ĕ-nīd*, a compound of selenium with a metal—same as SELENIURET, the latter being much less used. SELENITE, n. *sĕl'ĕ-nīt* [Gr. *sĕlē-nitēs*, foliated sulphate of lime]: crystallized sulphate of lime or gypsum (see below). SEL'ENIT'IC, a. *-nĭt'ĭk*, pertaining to or resembling selenite. SELENIURET, n. *sĕl-ēn'-yū-rĕt*, a compound of selenium with a metal or other elementary body. SELEN'IURETED, a. *-rĕt-ĕd*, combined with selenium SELENIURETED HYDROGEN, an ill-smelling and noxious gas.

SELE'NIUM: symbol Se, atomic weight 79.2. It was discovered by Berzelius (1817) in the refuse of a sulphuric acid factory. A non-metallic element occupying an intermediate place between sulphur and tellurium. Occurs in the free state in small amounts usually associated with native sulphur. Found in many minerals combined with various metallic elements as copper, lead, mercury, silver, etc. Here again the compound of selenium are found in company with the analogous compounds of sulphur. Free selenium is prepared from the compounds of selenium found in the dust deposited in the furnace flues where sulphides are burned in the manufacture of sulphuric acid. This is oxidized to selenius acid, which upon treatment with sulphurous acid gives selenium. Selenium exists in two allotropic forms. The one obtained as above is a red amorphous powder soluble in carbon di-sulphide, while if this powder be melted and again cooled suddenly to 210° C. it forms a dark vitreous mass insoluble in carbon di-sulphide. Crystalline forms are also known. In general chemical behavior it is closely related to sulphur and tellurium, all three forming analogous oxides, oxygen acids, and hydrogen compounds.

Selenious Acid, H_2SeO_3, a crystalline solid found by oxidation of selenium in presence of water, or as above. It is a di-basic acid forming salts called selenites having the general formula M_2SeO_3.

Selenic Acid, H_2SeO_4, a heavy liquid resembling sulphuric acid and formed by action of powerful oxidizing agents on selenium or selenious acid. It differs from sulphuric acid in being unstable, losing its oxygen readily and thereby passing to selenious acid. Also a di-basic acid forming salts called selenates (M_2SeO_4).

With hydrogen, selenium forms a very disagreeable smelling gas called seleniuretted hydrogen (H_2Se), the analogue of sulphuretted hydrogen. Selenium forms compounds with many metallic elements called selenides.

SELENOGRAPHY, n. *sĕl'ē-nŏg'ră-fĭ* [Gr. *selēnē*, the moon; *graphē*, a writing]: a description of the moon. SELENOGRAPH, n. *sĕl-ē'nō-grăf*, a delineation or picture of the moon's surface, or a part of it. SEL'ENOGRAPH'IC, a. *-nō-grăf'ĭk*, or SEL'ENOGRAPH'ICAL, a. *-ĭ-kăl*, pertaining to a description of the moon. SEL'ENOG'RAPHIST, n. *-nŏg'ră-fĭst*, or SEL'ENOG'RAPHER, n. *-fĕr*, one who studies the character of the moon, and describes it.

SELEUCIA, *sē-lū-shĭ'a:* name of seven ancient cities of Asia; in Syria, Pisidia, Pamphylia, Cilicia, Caria, and Mesopotamia; founded during the earlier existence of the dynasty of the *Seleucidæ* (q.v.). The two most distinguished were: 1. SELEUCIA PIERIA, founded by Seleucus Nicator, on the sea-shore, about 4 m. n. of the mouth of the Orontes, and strongly fortified. It was the seaport of Antioch, and became of great importance during the wars between the Seleucidæ and the Ptolemies for the possession of Syria. It rapidly declined under the Roman dominion. The ruins have been fully explored and described in modern times by Pococke (*Observations on Syria*) and Chesney (*Royal Geographical Society's Journal*, VIII.). Its formerly magnificent port is in such good preservation as to require few repairs to render it serviceable; and the remarkable tunnel 1,088 yards in length, through the solid rock—forming the only communication between the city and the sea—and the remains of its triple line of walls, of its citadel, temples, amphitheatre, necropolis, etc., all attest its ancient importance and splendor.—2. SELEUCIA ON THE TIGRIS, also was built by Seleucus Nicator, on the w. bank of the Tigris, 40 m. (according to Strabo 33) n.e. of Babylon, which was despoiled to supply materials for the construction of the new city. Situated in a district of great fertility, commanding the great trading-routes of Assyria, Babylonia, and western Persia, it rapidly rose to great wealth and splendor, supplanted Babylon as cap. of the e. portion of the Seleucide monarchy, and when in the acme of its greatness contained a pop. of more than 600,000. Even in Strabo's time, it was larger than Antioch in Syria, the greatest commercial emporium of Asia; and till its final destruction, its pop. is said to have never fallen below half a million. During the decline of the Seleucide monarchy, it became independent, and formed, from its wealth and splendor, an irresistible bait to the robber-tribes of southern Armenia and Media, who partially plundered it more than once. But its position on the confines of Persia, which gave it its greatness, was also the cause of its destruction; for when the Seleucide monarchy was swallowed up by the Romans, and the long and desolating struggle began between the latter and Persia, S., placed between two fires, was speedily brought to ruin. It was burned by Trajan (A.D. 116), and a few years afterward by Lucius Verus; and when visited by Septimius Severus was as desolate as the mighty city which it had supplanted. Emperor Julian found the whole country round it converted into a vast marsh, the haunt of innumerable beasts of chase and wild-fowl, and the city itself completely deserted.

SELEUCIDÆ, *sē-lū'sĭ-dē:* dynasty of kings to whom fell that portion of Alexander the Great's immense and ill-compacted monarchy which included Syria, a large portion of Asia Minor, and the whole of the eastern provinces.

SELEUCUS I., surnamed NICATOR, first of this line; B.C. about 358–280 (king B.C. 306–280); was son of Antiochus, distinguished officer in the service of Philip of Macedon. He was one of the conspirators against Perdiccas, and in the second partition of the provinces of Alexander the Great's kingdom, obtained Babylonia, to which, with the aid of Antigonus, he subsequently added Susiana; but a misunderstanding with that powerful chief having arisen, Seleucus took refuge in Egypt B.C. 316. The victory gained by Ptolemy over Antigonus's son Demetrius, at Gaza, having laid open the route to the East, Seleucus returned to his satrapy, amid the congratulations of his subjects, B.C. 312. Oct. 1 of this year (the date of Seleucus's return to Babylon) begins the *era of the Seleucidæ.* Having next recovered Susiana, he conquered Media, and extended his power to the Oxus and Indus. Of his campaign against Sandrocottus (q.v.) there are few details extant. In B.C. 306 he assumed the regal title; and four years afterward joined the confederacy of Ptolemy, Lysimachus, and Cassander, against the now formidable Antigonus, deciding the battle of Ipsus B.C. 301 chiefly by his cavalry and elephants. Being now, after Antigonus's death, the most powerful of Alexander's successors, he obtained the largest share in the conquered kingdom, a great part of Asia Minor and the whole of Syria falling to him. Toward the close of his reign, war broke out with Demetrius (now his father-in-law), and afterward with Lysimachus, King of Thrace and the other part of Asia Minor, both contests terminating in the defeat and death of his opponents, and being followed by his acquisition of the rest of Asia Minor. He was assassinated B.C. 280 by Ptolemy Ceraunus. Of Seleucus's personal character little can be gathered from the fragments of his history which remain; according to Pausanias, he was the most upright of Alexander's successors, unstained by those crimes which have foully blotted the characters of the others; but of his consummate generalship and great political talents we have sufficient proof. He pursued with great zeal the plan of 'Hellenizing' the East, by founding numerous Greek and Macedonian colonies in various parts of his dominions; he also built numerous cities, several of which—as Antioch in Syria, and Seleucia on the Tigris—rose to be among the most populous and wealthy in the world.—After the reigns of ANTIOCHUS I. (q.v.) and ANTIOCHUS II. (q.v.) SELEUCUS II. (reigned B.C. 246–226) surnamed CALLINICUS, obtained the throne; but having, at the instigation of his mother Laodice, murdered his stepmother Berenice, an Egyptian princess, he was driven from his kingdom by Ptolemy Euergetes (q.v.). However, he recovered his throne on Ptolemy's withdrawal; and though defeated in a great battle with

the Egyptians, he maintained his hold of Syria and most of Asia Minor against both the Egyptians and his younger brother Antiochus, who exercised independent authority over part of Asia Minor. Antiochus was at a later period wholly defeated in Mesopotamia, and soon after murdered by robbers. Seleucus II. undertook a great expedition against the revolted provinces of Parthia and Bactria, but was totally routed by Arsaces I., King of Parthia; while, on the n.w., several provinces were wrested from him by Attalus, King of Pergamus.—His sons, SELEUCUS III. (reigned B.C. 226–223) surnamed CERAUNUS, and ANTIOCHUS III. (q.v.) 'the Great,' were his successors, the latter being the first of the dynasty who came into collision with the Romans.—SELEUCUS IV. (reigned B.C. 187–175), surnamed PHILOPATOR, was eager to dispossess the king of Pergamus of the provinces which he had taken from the Syrian monarchy, but fear of the Romans prevented him from carrying out his design.—ANTIOCHUS IV. (q.v.) EPIPHANES (I.) ('the Illustrious'), conquered Cœle-Syria and Palestine from the Egyptians, to whom they had been given by his father; but retired from Egypt at the bidding of the Romans. He practiced the most atrocious cruelties on the Jews, whose religion he endeavored to root out, and introduce the Greek religion; but the heroic resistance of the Maccabees (q.v.) completely foiled his project. He died in a state of raving madness, attributed to his sacrilegious crimes by his subjects, who in derision converted his surname into EPIMANES ('the Madman').—The succeeding names of the dynasty were: ANTIOCHUS V., EUPATOR (reigned B.C. 164–162); DEMETRIUS I., SOTER (reigned B.C. 162–150), who regained Babylon, lost Judea, and was defeated and slain by the impostor Alexander Balas (reigned B.C. 150–146); DEMETRIUS II., NICATOR (reigned B.C. 146–138, 128–125), who overthrew the impostor, and was himself taken prisoner by the Parthians, Syria having been already seized by DIODOTUS surnamed TRYPHON, who set up the puppet ANTIOCHUS VI., THEOS (reigned B.C. 144–142), and afterward ascended the throne himself (reigned B.C. 142–137); ANTIOCHUS VII., SIDETES (reigned B.C. 137–128), who restored the royal line of the Seleucidæ; ANTIOCHUS VIII., GRYPUS (reigned B.C. 125–96), who was compelled to share his dominions with his half-brother, ANTIOCHUS IX., CYZICENUS (reigned B.C. 111–95); SELEUCUS V. or VI., EPIPHANES (reigned B.C. 96–94); and ANTIOCHUS X., EUSEBES reigned B.C. 95–83), who continued the division till B.C. 94, when the latter was victorious in a pitched battle, and seized the whole kingdom; for which, however, he was forced to fight with Philip, and ANTIOCHUS XI., EPIPHANES (II.), younger brother of Seleucus V; and DEMETRIUS III., EUCÆRUS (reigned B.C. 94–88), a third brother of Seleucus V., who, with Philip, next claimed the sovereignty, which was taken from them by Tigranes (reigned B.C. 83–69), King of Armenia, at the solicitation of the Syrians; ANTIOCHUS XII., DIONYSUS, a fourth brother of Seleucus V., and ANTIOCHUS XIII. (reigned B.C. 69–65), ASIATICUS. The short-lived prosperity

of this dynasty, for it had begun to decline during the reign of SELEUCUS II., 80 years after its foundation, was due principally to the fatal principle on which it was founded —viz., that of establishing a Græco-Macedonian power in a foreign country, instead of conciliating the attachment of the native populations, and governing them more in accordance with the Eastern method; the consequences were the successive revolts of the natives, the foundation of the independent and hostile kingdoms of Bactria, Parthia, Armenia, Judea, and the ultimate conversion of the small remnant into a Roman province by Cneius Pompeius B.C. 65.

SELF, n. *sĕlf*, plu. SELVES, *sĕlvz* [Icel. *sjálfr;* Goth. *silba;* Dan. *selv;* Sw. *sjelf;* Ger. *selbst*, self]: one's own individual person; personality; identity; one's self, as, the fondness we have for *self;* care of personal interest; selfishness: ADJ. particular; very, as *self*-same day: preceded by the pronouns *my, thy, him, her, it, them*, etc., *self* forms reciprocal pronouns, as *myself; self* used as a common prefix signifies by, in, of, to, or with, one's self or itself, as *self*-acting. SELF'ISH, a. *-ĭsh*, having chiefly or solely a view to one's own interest; influenced in actions from motives of private advantage; without regard for others; egotistical. SELF'ISHLY, ad. *-lĭ*. SELF'ISHNESS, n. *-nĕs*, the quality of being selfish; attention to one's own interests, regardless of the interests of others. SELF-ABASEMENT, n. humiliation from a sense of inferiority, guilt, or shame. SELF-ACTING, a. acting by or of itself. SELF-ACTION, n. action by or originating in itself. SELF-BEGOTTEN, a. begotten by one's own powers. SELF-COMMAND, n. that equanimity of mind which enables a man in trying situations to conduct himself with coolness and prudence; self-control. SELF-COMPLACENCY, n. satisfaction with one's character, performances, etc. SELF-CONCEIT, n. high opinion of one's self; vanity; arrogance; egotism; self-will. SELF-CONCEITED, a. vain; having a high opinion of one's own importance or abilities. SELF-CONCEITEDNESS, n. an overweening opinion of one's own importance or accomplishments. SELF-CONDEMNED, a. condemned by one's own conscience. SELF-CONDEMNATION, n. condemnation by one's own conscience SELF-CONFIDENCE, n. reliance on one's own judgment or ability. SELF-CONFIDENT, a. relying on one's own judgment. SELF-CONSCIOUS, a. unduly conscious of one's own acts or states as belonging to one's self and their effects upon others. SELF-CONTRADICTION, n. the act of contradicting itself or themselves; a proposition of two terms, one of which contradicts the other. SELF-CONTRADICTORY, a. contradicting itself or themselves. SELF-CONTROL, n. restraint exercised over one's self. SELF-CONVICTED, a. convicted by one's own consciousness or knowledge. SELF-CULTURE, n. education or training of one's self. SELF-DECEIT, or SELF-DECEPTION, n. deception that originates from one's own mistake or fault. SELF-DEFENSE, n. the act of defending one's own reputation, person, or property. SELF-DEGRADATION, n. the act or the effect of lowering or debasing one's self. SELF-

DELUSION, n. a delusion respecting one's self. SELF-DENIAL, n. forbearance to gratify one's appetites or desires. SELF-DESTRUCTION, n. death by one's own hands; suicide. SELF-DETERMINATION, n. determination of one's own acts by one's own powers. SELF-DEVOTED, a. voluntarily devoted. SELF-DEVOTION, n. willingness to sacrifice one's self for the sake of others; self-sacrifice. SELF-DISTRUST, n. want of confidence in one's self or one's own powers. SELF-EDUCATED, a. educated by one's own independent efforts. SELF-ELECTED, a. appointed or elected by one's own self. SELF-ENJOYMENT, n. satisfaction or pleasure in one's self. SELF-ESTEEM, n. high opinion of one's self; an organ so called by the phrenologists. SELF-EVIDENT, a. evident without proof or reasoning. SELF-EXAMINATION, n. an inquiry into one's own conduct or motives. SELF-EXISTENCE, n. existence by one's self—an attribute peculiar to Deity. SELF-EXISTENT, a. independent of any other being. SELF-EXPLAINING, a. capable of being understood without explanation. SELF-EXPLANATORY, a. that explains itself. SELF-HEAL, n. the popular name of two plants, the *Prunel'la vulgāris*, ord. *Labiātæ*, and the *Sanicŭla vulgāris*, or sanicle, ord. *Umbellif'ĕræ*, so named from their supposed curative powers SELF-IMPORTANCE, n. exaggerated estimate of one's own merit, manifested in conduct or manners; pomposity. SELF-IMPORTANT, a. manifesting an exaggerated estimate of one's own merits. SELF-IMPOSED, a. voluntarily taken on one's self. SELF-INDULGENCE, n. the unrestrained indulgence of one's passions, appetites, and desires. SELF-INTEREST, n. regard to one's self only. SELF-INTERESTED, a. marked or prompted by personal motives. SELF-LOVE, n. love of one's own person, interest, or happiness. SELF-MADE, a. raised in the world by one's own industry. SELF POSSESSED, a. calm; collected; having self-command. SELF-POSSESSION, n. calmness and equanimity of mind. SELF-PRAISE, n. the praise or commendation of one's self. SELF-PRESERVATION, n. the preservation of one's self from injury or destruction—a powerful instinct possessed by all living creatures. SELF-REGISTERING, a. recording its own indications of phenomena, said of certain scientific instruments. SELF-REGULATED, a. regulated by one's self or by itself. SELF-RELIANCE, n. reliance on one's own powers. SELF-RELIANT, a. trusting to one's own powers. SELF-REPROACH, n. the act of reproaching or condemning one's self. SELF-RESPECT, n. regard for one's own character and the approval of conscience. SELF-RESTRAINT, n. restraint or command over one's self; self control. SELF-RIGHTEOUS, a. righteous in one's own esteem. SELF-RIGHTEOUSNESS, n. confidence in and reliance on one's own merit or virtue—always used in an equivocal sense, indicating a want rather than actual possession. SELFSAME, a. precisely the same; the very same. SELF-SATISFYING, a. giving satisfaction to one's self. SELF-SEEKING, a. seeking one's own interest or happiness alone; selfish: N. the act or habit of seeking one's own interest and happiness. SELF-SUFFICIENCY, n self-existence; independence of others—attributes of the Deity; a high or

undue opinion of one's own strength or worth. SELF-SUFFICIENT, a. independent; capable of working out one's ends; having full confidence in one's own powers; haughty. SELF-TAUGHT, a. educated and trained by one's self. SELF-TORTURE, n. the act of inflicting pain on one's self, mentally or physically. SELF-WILL, n. obstinacy. SELF-WILLED, a. not yielding to the expressed wishes or commands of those whom we are bound to obey; obstinate. SELF-WORSHIP, n. the idolizing of one's self. *Note.*—The compounds of self are very numerous, and are mostly self-explanatory; the most common are given above.

SELF-DEFENSE, in Law: protection of one's own person or property from injury. In defending oneself a person may lawfully employ just so much violence as is 'necessary,' even to the taking of life. Constructively, it is self-defense for a husband or a wife to repel an assailant of either, and the same is to be said of parents and children, master and servant. If two persons on sudden provocation enter into combat, and in the fight one of them is killed, the slayer is guilty at least of manslaughter, unless he can prove that before dealing the fatal blow he had refused further combat, and had retreated as far as he could with safety. Of course one is not acting in necessary self-defense who pursues and kills an aggressor from whom he is no longer in danger.

SELF-DENYING ORDINANCE: in Eng. history, a measure carried through parliament 1645 by the influence of Cromwell and the Independents, with the view of removing Essex and the Presbyterians from control of the army. It was moved by a fanatic of the name of Zouch Tate, who, on the ground that 'there is but one way of ending so many evils, which is, that every one of us freely renounce himself,' proposed that 'no member of either house shall, during this war, enjoy or execute any office or command, civil or military, and that an ordinance be brought in accordingly.' The ordinance, which was clearly intended to take the executive power out of the hands of the more moderate politicians, and form an army independent of parliament, was the subject of violent and protracted debate, but eventually passed in both houses, and became law. The consequence was that Essex, Warwick, Manchester, and others gave in their resignation, and the conduct of the war was intrusted to Fairfax; Cromwell, to whom, as a member of the lower house, the self-denying ordinance extended, as much as to Essex and the rest, had the duration of his commission prolonged by the commons on account of his invaluable services as a leader of cavalry, and by his brilliant achievements soon surpassed his commander in reputation.

SELF'-HEAL: see PRUNELLA (plant).

SELFISH, SELFSAME: see under SELF.

SELF'RIDGE, THOMAS OLIVER: American naval officer: b. Boston, Mass., 1804, Apr. 24; d. Waverly, Mass., 1902, Oct. 15. He entered the navy in 1818 as a midshipman and in 1827 was commissioned lieutenant. He was in command of the Dale during the Mexican war, and was present at the capture of Matanzas and Guaymas. In 1861 he took charge of the frigate Mississippi of the Gulf Squadron, but an old wound forced him to retire from sea service. He was made commandant of the navy yard at Mare Island, California, and was president of the Examining Board. He was retired in 1866.

SELFRIDGE, THOMAS OLIVER, JR.: American naval officer, son of the preceding; b. Charlestown, Mass., 1836, Feb. 6. He was graduated from the United States Naval Academy 1854, and six years later was promoted lieutenant. During the civil war he was on board of the Cumberland when she was sunk by the Merrimac, and commanded the Cairo, an ironclad, which was blown up in Yazoo river He had command of a battery at the capture of Vicksburg and was in both attacks on Fort Fisher. In 1869 he was promoted to commander, and superintended the surveys for the inter-oceanic canal across the Isthmus of Darien. He was a member of the International congress at Paris 1876 and became rear-admiral in 1896 and was retired 1898, Feb. 6.

SELIGMAN, EDWIN ROBERT ANDERSON: American political economist; b. New York, 1861, Apr. 25. He was graduated from Columbia in 1879, studied three years abroad and on his return became prize lecturer in political economy at Columbia in 1885. He was adjunct professor of political economy there 1888-91, and has been full professor since that date. He has been associated with social reform movements, is president of the Tenement House Building Company, was long connected with the Educational Alliance, and is an industrial writer on financial and economic questions. Besides editing *The Political Science Quarterly,* he has published *Railway Tariffs* (1887); *Two Chapters on the Mediæval Guilds of England* (1887); *Progressive Taxation in Theory and Practice* (1894); *The Shifting and Incidence of Taxation* (1899); *Essays on Taxation* (1900); *Economic Interpretation of History.*

SELIGMAN, JESSE: American banker; b. Bayersdorf, Bavaria, 1825; d. Coronado Beach, Cal., 1894, Apr. 23. He emigrated to America in 1840, and after joining his brothers in business for a few years went in 1849 to California where he amassed a fortune in legitimate business during the early years of the mining fever. Removing to New York, and entering the firm of J. & W. Seligman & Co., he was soon recognized as one of the leaders in finance. He was president of the Hebrew Orphan Asylum of New York for many years, and his name was associated with civic and educational movements.

SELIGMAN, JOSEPH: American financier; b. Bayersdorf, Bavaria, 1809, Sept. 22; d. New Orleans, 1880, Apr. 25. The eldest of eight brothers, all of them later to be united in a banking firm, with branches throughout the world, his attention was first directed to medicine and theology, but his tastes soon developed in other lines. In his 17th year he came to America and entered the employ of Asa Packer in Pennsylvania as cashier. He went next to Greensboro, Ala., where he opened a store, his success encouraging two of his brothers to settle in Watertown, N. Y., about 1841. In 1848, the rest of his family having emigrated, he removed to New York and organized with them an importing house which was soon among the most prominent in its line. When the civil war began, the Seligmans established the banking firm of J. & W. Seligman & Co., with branches in London, Paris, Frankfort, and San Francisco, each in charge of one of the brothers. Joseph was offered the secretaryship of the treasury by President Grant, who felt entire confidence in his financial ability and patriotism, which had already done so much to maintain the national credit.

SELIM, *sē'lĭm*, I., Sultan of Turkey; 1467-1520, Sept. 22 (reigned 1512-20); son of Bajazet II. He dethroned his father by aid of the Janizaries, 1512, and ascended the throne. To secure himself in his elevation, he caused his father, brothers, and nephews to be put to death, thus beginning a policy which he pursued inflexibly through his whole subsequent career, viz., to destroy without scruple every actual or possible obstacle to the accomplishment of his ends. Urged on by a devouring appetite for conquest, and by the warlike fanaticism of the Janizaries, he declared war (1514) against Shah Ismail of Persia, and marched eastward with an army of 250,000 men, massacring on the way 40,000 Shiites. He encountered Ismail at Calderoon, and defeated him with immense loss; but a spirit of disaffection breaking out in his army, he was compelled to content himself with this success, which gave him possession of Diarbekir and Kurdistan. In the following year, he overran Armenia; and leaving his lieutenants to complete this conquest, he marched against the Mameluke sultan of Egypt, whom he had previously endeavored to detach from intimate alliance with the Persian monarch. Kansû-ghori, the Egyptian sultan, was totally defeated (1516) at Marjabik by Selim, and Syria became the prize of the victor; and Kansû's successor, Touman-Bey, was still more unfortunate, his army being almost extirpated (1517) at the battles of Gaza and Rudania. The victorious Turks then entered Cairo without opposition; Touman-Bey and his chief supporters were put to death, and Egypt incorporated with the Ottoman empire. The last lineal descendant of the Abbaside caliph, who was then resident in Egypt, transmitted to Selim the religious prestige which

had devolved on himself by descent, and at the same time bestowed on him the title 'Imaum,' and the standard of the Prophet. In consequence of this gift, the Ottoman sultan became the chief of Islam, as the representative of Mohammed; and the sacred cities of Mecca and Medina, with the chief Arabian tribes, in consequence acknowledged his supremacy. Thus, in less than four years, Selim did more to extend the Ottoman empire than any of his most renowned predecessors during a whole reign. He also laid the foundation of a regular marine, constructed the arsenal of Pera, chastised the insolence of the Janizaries with savage severity, and labored to ameliorate, by improved institutions, the condition of the various peoples he had conquered. He died while planning fresh campaigns against both Persians and Christians. This prince, who in a sense merited his title of *Yavuz* (the Ferocious), was nevertheless a lover and encourager of literature, and even cultivated the poetic art. Selim was succeeded by his son, Solyman the Magnificent.

SELIM II., sultan of Turkey: d. 1574, Dec. 12. He succeeded his father Solyman II. in 1566. The chief events of his reign were his capture of Cyprus from the Venetians in 1570 and Tunis from the Spaniards in 1571. In that year occurred the great naval battle of Lepanto in which he suffered defeat at the hands of the combined Spanish and Italian fleets.

SE'LIM III., sultan of Turkey: 1761, Dec. 14—1807 (reigned 1789-1807); only son of Mustapha III. He ascended the throne on the death of his uncle, Abdul-Hamid, and entered on a policy of renovation and progression; but the war with Russia, in which his newly raised army of 150,000 men was totally defeated, first by the Prince of Coburg, and next by Suwarof, stayed his schemes of reform. He was compelled 1791 to cede Choczim to Austria, and in the following year, all his possessions beyond the Dniester to Russia. About this time, his harmony with Napoleon was troubled by the expedition of the French to Egypt, and subsequently by the question of the recognition of the French empire; but on the whole, Selim continued the faithful ally of France; and at every opportunity pursued with ardor his various reforms, establishing cannon-foundries, and organizing a body of troops ('the Nizam-Djedit') armed, clothed, and disciplined in European fashion; but this last reform stirred up against him (1805) all the fanatic bigotry of his subjects. The priests of Islam even preached revolt in different parts of the empire, and accused their sovereign of despising the holy injunctions of the Koran; and at length a formidable rebellion broke out in which the Nizam-Djedit were overpowered and the rebels marched into Constantinople, their ranks being swelled by bodies of disaffected Janizaries. All those who had favored or forwarded the sultan's schemes were seized

and put to death, and Selim was compelled to issue a decree suppressing the new institutions, and soon thereafter to resign the throne to his cousin, *Mustapha IV.* (reigned 1807-8). On the arrival of Mustapha-Bairaktar, the pasha of Rustchuk, one of the sultan's chief advisers, who had marched upon Constantinople, with a view to reinstate Selim on the throne, the monarch was strangled, and his body cast at the feet of Bairaktar. With Selim perished the first attempt at reformation in Turkey.

SELJUKS, *sĕl-jôks'*, or SELJUK-TURKS: offshoot of the Hoei-He or Hoei-Hu, a collection of tribes of Turkish race, who, being driven southwestward from the Chinese wall, had in 744 overwhelmed that Turkish empire of Kiptchak which had given so much annoyance to the Sassanidæ (q.v.) during their reign in Persia. The Hoei-Hu rapidly extended their power from the Caspian Sea as far as the Hoang-ho, and at the time when the Seljuks separated themselves from them were ruled by a chief named Bigû Khan. Seljuk, from whom the Seljuks derived their name, was chief of a small tribe which had gained possession of Bokhara and the surrounding country. His sons, attracted by the beauty and fertility of Khorassan, began, about 1027, to migrate to that country, and after struggles with the Ghiznevide sultans established themselves in n. Khorassan, with TOGRUL BEG, eldest grandson of Seljuk, as their chief, and Nishapur as capital. Togrul, leaving his brother in Khorassan, set out on his conquering march, subdued Balkh and Khaurezm 1041, Irak-Ajemi 1043, subsequently adding Kerman and Fars. He then advanced to Bagdad, which he took 1055, dethroning the last vizier of the Dilemite (see SAMANI) dynasty, and being invested by the reigning caliph with the vacant office; after which he completed his conquest of Persia by the reduction of Irak-Arabi and Mosul about 1061. The Seljuks were zealous Mohammedans, and Togrul Beg built numerous mosques, subsidized pious and learned men, and treated the caliph —his spiritual chief—with profound respect. After his death 1063, his nephew, ALP-ARSLAN (q.v.), succeeded to supreme power, and became one of the most renowned monarchs of Asia. His son, MELEK SHAH (reigned 1073-93), the most powerful monarch of this dynasty, added, by means of his generals, Arabia, Asia Minor, Armenia, Syria and Palestine, and Transoxiana to his empire, which now extended from the Hellespont to the borders of Chinese Tartary; and even the ruler of Cashgar acknowledged his authority. This empire, though extensive and ill-compacted, was preserved in order and prosperity by his able minister, the virtuous Nizam-ul-Mulk, under whose firm and wise government the rights of all classes were maintained, religion promoted, and learning encouraged, till the Persians, who had dreaded the conquest of their country by the Turks as the worst of evils, were forced to confess that it had proved the greatest of

blessings. In 1092 Melek Shah, lending an ear to the misrepresentations of Nizam-ul-Mulk's enemies, deprived him of his office; and the aged minister was soon assassinated by one of the followers of Hussun Subah, chief of the Assassins (q.v.), the mortal enemy of the good ex-vizier. Hospitals, caravansarais, bridges, roads, and canals attest the zeal with which the commercial interests of the empire were furthered; while the colleges of Bassora, Ispahan, and Herat, the law-college of Bagdad, and the observatory (first in Asia) of the same city, indicate the care given to literature and science. Melek Shah, under whom the empire of the Seljuks had attained the height of its power and splendor, laid a sure foundation for its rapid decline, by subdividing it into a number of separate principalities, all professedly subject to the central state of Iran or Bagdad. The chief principalities were: 1. The central state of *the Seljuks of Iran,* whose ruler was the vizier of the caliph, and exercised direct authority over n. and w. Persia to the borders of the Arabian desert. The chief monarchs of this branch were Mohammed Shah, whose generals warred with the Crusaders in Palestine, and Sultan Sanjar, one of the most celebrated of the Seljuk princes, great both in success and in misfortune: this branch was annihilated 1194 by the shah of Khaurezm. 2. *The Serjuks of Kerman,* annihilated 1191 by the Ghuz Turkomans. 3. *The Seljuks of Iconium,* who ruled over Asia Minor, and whose founder was Soliman, great-grandson of Seljuk: this branch endured 1075-1299; and was engaged in numerous wars with the Byzantines and with the Crusaders, both of whom learned to dread its power. During its last years, it was tributary to the Mongols; and 1299 the present Turkish empire rose on the ruins of its power (see OTHMAN). 4. *The Seljuks of Aleppo,* who ruled from 1079 till their extinction 1114. 5. *The Seljuks of Mosul,* speedily supplanted by *attabegs,* or independent governors, of whom Zenghi and his renowned son, Noureddin (q.v.), were most celebrated. 6. *The Seljuks of Damascus,* offshoot (1096) from the Aleppo principality, which lasted till 1155, when it was ended by Noureddin. 7. *The Seljuks of Mardein,* who appear in common history only as allies of the Seljuks of Iconium, Mosul, Aleppo, and Damascus, against the mighty crusading armies of w. Europe. 8. *The Seljuks of Khaurezm* (*Khiva*), who founded a great empire, including the whole country within the Jaxartes, the Bolor Mountains, the Indus, the Sea of Oman, and the Persian Gulf; but the last monarch, Allah-ed-din Mohammed Shah, having wantonly put to death some Mongol merchants who were pursuing their avocations within his dominions, was doomed to destruction by the terrible Genghis Khan (q.v.), who crossed the Sir-Daria, conquered Transoxiana, defeated Mohammed's armies, and drove the shah himself to take refuge in an island of the Caspian, where he died. The advance of the Mongols

was gallantly opposed by Mohammed's renowned son, Jelal-ed-din, who twice defeated them; but being totally routed (1221), on the w. bank of the Indus, by Genghis himself, he plunged his horse into the Indus, and safely reached the opposite bank, none of his enemies daring to follow him. The whole of this extensive empire then fell under Mongol domination.

SEL'KIRK (or SEL'CRAIG), ALEXANDER. See JUAN FERNANDEZ.

SEL'KIRK SETTLEMENT. See MANITOBA.

SELKIRKSHIRE, *sĕl'kĕrk-shĕr*, in ancient times called Ettrick Forest: county in Scotland, bounded by the counties Midlothian, Roxburgh, Dumfries, and Peebles, on the n., e., s., and w. respectively; length from n. to s. about 28 m.; breadth from e. to w. 16 to 18 m.; consisting mainly of the two parallel valleys through which flow the rivers Ettrick and Yarrow; 260 sq.m., or 166,524 acres. It is mostly a pastoral county, and some of the hills are above 2,000 ft. in height. The hills are rounded at the top instead of peaked, and are covered generally with grass, affording excellent pasturage, but in some places with heather. The arable land is about 300 to 800 ft. above sea-level, and is about one-eighth of the area. The banks of several streams are beautifully wooded; but the extensive woods from which the county originally took its name of the Forest have disappeared. The average of produce is above that of most of the other counties. This county contains some historical scenes, besides the field of Philiphaugh. Oakwood Castle, in ruins, was the residence of the famous wizard Michael Scot, and Newark, also in ruins, was the residence of Anne, Duchess of Buccleuch, where the *Lay of the Last Minstrel* is represented by Scott as having been sung. The Douglas family, four centuries ago, were the principal proprietors of Selkirkshire, the Duke of Buccleuch now holds about two-thirds of it. Pop. (1901) 23,356.

SELL, v. *sĕl* [Icel. *selia;* Dan. *sælge;* AS. *sellan*, to transfer, to deliver: Icel. *sala*, delivery, bargain]: to give or transfer to for a price; the opposite of *to buy;* to part with for an equivalent; to have traffic; to betray for a reward; in *slang*, to cheat; to deceive: N. in *slang*, a deception; a take-in. SELL'ING, imp. SOLD, pt. and pp. *sōld*, did sell; given to for a price. SELL'ER, n. *-ĕr*, one who sells. TO SELL ONE'S LIFE DEARLY, to cause great damage and loss to those who are taking or seeking one's life. TO SELL ONE'S SELF TO EVIL, to do wrong without restraint.

SELL, or SELLE, n. *sĕl* [F. *selle*, a saddle—from L. *sella*, a seat—from *sedĕrĕ*, to sit]: in *Scot.*, a stool; seat; in *OE.*, a saddle; a throne.

SELLANDER, n. *sĕl'ăn-dĕr*, or SELLENDER, n. *sĕl'ĕn-der* [F. *solandre*, an ulcer in the leg of a horse]: a dry scab in a horse's hock or pastern, due to lack of cleanliness.

SELMA: Ala.; city, county-seat of Dallas co.; on the Alabama river, at the head of steamboat navigation, and on the Louisville & N., the Birmingham, S. & N. O., the Southern, and the Western R. of A. railroads; about 50 m. w. of Montgomery and 158 m. n.e. of Mobile. It has steamer connections with Mobile and other ports. It is in an agricultural region in which cotton is one of the chief products. During the civil war the city was the center of military operations; it had a Confederate navy-yard, arsenal, powder-works, and artillery-foundries. The place was captured by the Union forces 1865, Apr. 2.

The principal industrial establishments are railroad machine shops, cottonseed-oil mill, planing mill, car-wheel shops, cotton factories, cotton warehouse, iron works. The city has a large trade in cotton and lumber products, coal, and in iron products. Pop. (1910) 13,649.

SELTERS WATER, *sĕl'terz* (commonly but incorrectly written *Seltzer Water*): mineral water named from the village of Lower Selters near Limburg, in the duchy of Nassau, where several springs united, in one basin, yield 5,000 cubic feet an hour of this sparkling and effervescing mineral water. Its chief ingredients are carbonic acid, carbonate of soda, and common salt. It acts as a mild stimulant of the mucous membranes and as a diuretic; and is applied in chronic disorders of the digestive, respiratory, and urinary organs. It is recommended as a beverage in cases of liver complaint, and in hot climates and seasons. More than 1½ millions of jars or bottles of this famous water are exported yearly to all quarters of the world. The spring was discovered early in the 16th c., but was at first so little prized that in the middle of the 18th c. it was rented for $1. The water is little drunk at the spring. Artificial Selters Water is extensively manufactured on a large scale and for domestic use.

SELTZER WATER, n. *sĕlts'ėr waw'tėr:* mineral water from *Selters*, in Nassau, Germany. *Note.*—The correct spelling is SELTERS WATER (q.v.).

SELVAGE, n. *sĕl'vāj*, or SELVEDGE, n. *sĕl'vĕj* [O.Dut. *selfegge*, the selvage: a corruption of *self-edge*—that is, that which makes an edge of itself without hemming]: the border or edge of cloth which is formed in weaving it. SEL'VAGEE', n. *-vă-jē'*, in a *ship*, flexible rope composed of yarn not twisted together, but bound together by other yarn or marline. SEL'VAGED, a. *-vājd*, or SEL'VEDGED, a. *-vĕjd*, having a selvage.

SELVAS. See SILVAS.

SELVES, *sĕlvz:* plu. of SELF, which see.

SELWYN, *sĕl'wĭn*, GEORGE AUGUSTUS, D.D.: 1809-1878, Apr. 12; b. Richmond, Surrey, England. He studied at Cambridge; was tutor at Eton, and for a little while rector at Windsor; and was consecrated 1841 first missionary bp. of New Zealand. After long and faithful service

in this field, he became 1867 bp. of Lichfield. In 1874 he visited Canada and the United States. He published *Are Cathedral Institutions Useless?* (1838); *Sermons* (1842); *Tribal Analysis of the Bible* (1855); and *The Work of Christ in the World* (1855). He died at London. His *Life,* by the Rev. H. W. Tucker, appeared 1878.

A memorial fund which was started soon after his death grew in four months to about £16,000, and was applied to the founding of SELWYN COLLEGE, in Cambridge Univ.: 19th college in the order of establishment in the university. At this institution a university education can be acquired at a very moderate cost, and there is rigid adherence to the principles and doctrines of the Established Church. The college was founded 1882.

SEMAPHORE, n. *sĕm'ă-fōr* [Gr. *sēma,* a sign; *phoros,* bearing]: mechanical device for telegraphing by means of signal-posts; that which conveys signs or signals. The semaphore was in use for telegraphy before the application of the electric current. The system was established first by the French 1794, for conveying intelligence from the capital to the armies on the frontier: it was introduced into England 1795. These semaphores consisted of towers at intervals of 5 to 10 m., on commanding sites. On the top of each tower was the telegraph apparatus, which at first comprised 6 shutters arranged in 2 frames, by the opening and shutting of which, in various combinations, 63 distinct signals could be formed. In 1816 this was changed to a mast with 2 arms, similar to many of the present railway signals: the arms were worked from within the tower by winches in the look-out room, where a powerful telecsope in either direction constantly commanded the mast of the next station. The semaphore has given place to the electric telegraph. In calm weather, when flags will not extend, semaphores are employed on board ship for signalling: on land almost their only use is as a track-signal in connection with the block-system on railroads.—See SIGNALS.

SEMATOLOGY, n. *sē-ma-tŏl'o-jĭ* [Gr. *sēma, sēmatos,* a sign]: doctrine of signs, especially of verbal signs, in the operations of thinking and reasoning; the science of language as expressed by signs.

SEMBLABLE, a. *sĕm'blă-bl* [F. *semblable,* like—from *sembler,* to seem—from L. *simulārĕ,* to seem: *simĭlĭs,* like]: in *OE.,* like; resembling: N. representation; likeness. SEM'BLABLY, ad. similarly.

SEMBLANCE, n. *sĕm'blăns* [F. *semblance,* resemblance; *sembler,* to seem—from L. *simĭlĭs,* like]: likeness; appearance; show; figure. SEM'BLANT, a. in *OE.,* having the appearance of anything; like: N. resemblance; show; figure. SEM'BLATIVE, a. in *OE.,* suitable; resembling; fit. —SYN. of 'semblance': likeness; resemblance; similarity; similitude; representation; appearance; show; figure.

SEMBRICH, MARCELLA: Austrian opera singer; b.

Lemberg, Galacia, 1858, Feb. 15. She studied violin and piano at first; her master on the latter instrument being Franz Liszt. When it was discovered that she had a remarkable voice she went to Milan to study with Lamperti, and made her first appearance at Athens in *I Puritani.* Shortly afterward she became attached to the company of the Royal Opera House, Dresden, and remained until 1880. That year she appeared first in London. She came to the United States in 1883, since which time she has reappeared here in several seasons of concerts and opera. In 1903-9 she was the leading coloratura soprano at the Metropolitan Opera House. Her repertory embraces a wide range of the Italian operas. She was one of the most popular singers of the many whom the musical world has acclaimed, uniting with her superb art, a personality that endeared her to all with whom she came in contact. While at the height of her career, she decided to retire from the stage, and her last appearance in America was on the evening of Feb. 6, 1909, at the Metropolitan Opera House, New York City.

SEME, a. *sĕm-ā'* [F. *semé,* sown—from *semer,* to sow]: in *her.,* strewn or powdered over with figures, as stars, crosses, etc.; *aspersed* or *powdered* are sometimes used in this meaning. Semé of cross crosslets is termed *crusilly,* and of billets *billety.*

SEMECARPUS, *sĕm-ē-kâr'pŭs:* genus of trees of nat. order *Anacardiaceæ.* The Marking Nut of India is *S. anacardium,* a tree 50 ft. high, growing on mountains. The swollen receptacle of the flower becomes a succulent fruit, eatable when roasted, but astringent and acrid when raw. On the receptacle is seated the nut, heart-shaped and black, consisting of a kernel—not unwholesome, though rarely eaten—surrounded by two skins, between which is a black acrid juice. This juice is used in medicine as an external application to heal rheumatism, etc. It is also in general use in India for marking cotton cloth; and the color is improved, and running prevented, by addition of a little quicklime and water. The wood of the tree contains so much acrid juice that it is dangerous to work upon.

SEMEIOLOGY and SEMEIOTIC. See Semiology, etc.

SEMECARPUS: a genus of trees of the *Anacardiaceæ,* containing about 40 species, and indigenous to the East Indies. The leaves are alternate and coriaceous, and the small flowers having sepals, petals, and stamens in fives, three styles, and a one-celled ovary, are borne in bracted terminal or lateral panicles. The fruits are kidney-shaped nuts on a thickened pedicel, with a hard, thick, resinous pericarp. The marking-nut tree (*S. anacardium*) is the most important species. The pericarp of its fruit furnishes a juice which is greatly used in India for marking clothes, for ink and for a dye; it is also

employed for warding off white ants and for a medicine in rheumatism, warts and leprosy; and when pounded and boiled in rape-seed oil, stays putrefaction when started in hides. The seed itself, which is called oriental cashew-nut or malacca bean, and the fleshy pedicel are eaten by the natives. The resin of this species yields the varnish of Sylhet, and an oil derived from it mixed with the milk of euphorbia is made into birdlime. *S. panduratus* also abounds in caustic black juice.

SEMELE, *sĕm'ĕ-lē:* according to Greek mythology, the mother of Zeus of Dionysus, or Bacchus, the god of wine. See BACCHUS.

SEMEN, n. *sē'mĕn* [L. *sēmen,* seed—from *sero,* I sow: It. *seme*]: the seed of animals; sperm; the seed of flowering plants. SEMINAL, a. *sĕm'ĭ-năl,* of or belonging to seed; radical; germinal; in *bot.,* applied to the cotyledons or seed-leaves. SEM'INA'TION, n. *-nā'shŭn,* the act of sowing; in *bot.,* the natural dispersion of seeds.

SE'MENCINE—SE'MEN CIN'Æ—SE'MEN CON'TRA. See ARTEMISIA.

SEMERARA, *sā-mā-rä'rä:* (1) A group of islands of the Philippine Archipelago lying 2 m. s. of Mindoro, in the channel between Mindoro and Panay. The group consists of 8 islands and a number of small islets; area 60 sq.m. The people are Visayans, and are mostly engaged in turtle and trepang fishing. Pop. 500. (2) The largest island of this group; area, 35 sq.m. It is hilly, the highest elevation being 512 ft. The w. coast is indented with several bays, but none afford good anchorage; there is sheltered anchorage to the s. of the island during the n.e. monsoon. Coal of good quality is found, especially in the north.

SEMES'TER, *sĕmĕs'tĕr,* n. [Fr. *semestre;* Lat. *semestris,* from *sex,* six and *mensis,* month]: a college half-year, about five months, measuring the fall or the summer course in various universities.

SEMI-, *sĕm'ĭ* [L. *semi,* half]: a common prefix, signifying 'half; half of; in part; partially': the compounds of *semi* are for the most part easily understood, if the meaning of the latter part is known: a hyphen is usual after *semi.*

SEMI-ACID, a. *sĕm'ĭ-ăs'ĭd* [*semi,* and *acid*]: half acid.

SEMI-AMPLEXICAUL, a. *sĕm'ĭ-ăm-plĕks'ĭ-kawl* [*semi,* and *amplexicaul*]: in *bot.,* embracing the stem half round, as a leaf.

SEMI-ANATROPAL, a. *sĕm'ĭ-ăn-ăt'rō-păl* [*semi,* and *anatropal*]: in *bot.,* half-anatropal—applied to ovules.

SEMI-ARIAN, n. *sĕm'ĭ-ā'rĭ-ăn* [*semi,* and *Arian*]: in *eccles. hist.,* one who embraced some of the principles of the Arians, and disguised others under milder terms.

SEMI-BARBARIAN, a. *sĕm'ĭ-bâr-bā'rĭ-ăn* [*semi,* and *barbarian*]: only partially civilized.

SEMIBREVE, *sĕm'ĭ-brēv,* in Music: note of half the duration of the breve of old ecclesiastical music, but the longest note in use in modern music. It is represented by a character circular or elliptical in form, and is adopted as the integer or measure-note, the other notes —minim, crotchet, quaver, etc.—being proportional parts of it.

SEMICIRCLE, n. *sĕm'ĭ-sėr'kl* [*semi,* and *circle*]: half a circle; the part of a circle separated by the diameter. SEM'ICIR'CLED, a. *-sėr'kld,* formed as a semicircle. SEMICIRCULAR, half-round.

SEMICOLON, n. *sĕm'ĭ-kō'lŏn* [*semi,* and *colon*]: in written or printed composition, the point or character (;) used to mark a longer pause than a comma, or to mark off a clause or member of a sentence.

SEMI-COLUMNAR, a. *sĕm'ĭ-kō-lŭm'nėr* [*semi,* and *columnar*]: in *bot.,* flat on the one side and round on the other.

SEMI-CONSCIOUS, a. *sĕm'ĭ-kŏn'shŭs* [*semi,* and *conscious*]: imperfectly conscious.

SEMI-DEISTICAL, a. *sĕm'ĭ-dē-ĭs'tĭ-kăl* [*semi,* and *deistical*]: bordering on deism.

SEMI-DIAMETER, n. *sĕm'ĭ-dī-ăm'ĕ-tėr* [*semi,* and *diameter*]: half the diameter; the radius of a circle.

SEMI-DIAPASON, n. *sĕm'ĭ-dī'ă-pā'sŏn* [*semi,* and *diapason*]: an imperfect octave; an octave diminished by a lesser semitone.

SEMI-DEMI-SEMIQUAVER, *sĕm'ĭ-dĕm'ĭ-sĕm'ĭ-kwā'-vėr,* in Music: note of which 8 are equivalent to a quaver, 32 to a minim, and 64 to a semibreve.

SEMI-DOUBLE, a. *sĕm'ĭ-dŭb'l* [*semi,* and *double*]: in *bot.,* having the outermost stamens converted into petals, while the innermost stamens continue perfect.

SEMI-FLEXED, a. *sĕm'ĭ-flĕkst* [L. *semi,* half; *flexus,* bent—from *flecto,* I bend]: half-bent.

SEMI-FLOSCULAR, a. *sĕm'ĭ-flŏs'kū-lėr,* or SEMI-FLOSCULOSE, a. *-kū-lōz* [*semi,* and *floscular*]: in *bot.,* having all the florets liguate, as in the dandelion.

SEMI-FLUID, a. *sĕm'ĭ-flô'ĭd* [*semi,* and *fluid*]: imperfectly fluid.

SEMI-JUDAIZERS, n. *sĕm'ĭ-jū'da-īz-ėrz:* in *chh. hist.,* a sect of Socinians, founded by Francis Davides, a Hungarian, who denied that prayer or any other religious worship should be offered to Jesus Christ.

SEMILOR, n. *sĕm'ĭ-lawr* [prefix *semi-;* F. *or,* gold]: alloy for cheap jewelry, etc., consisting of copper five parts and zinc one part.

SEMI-LUNAR, a. *sĕm'i-lô'nėr* [*semi,* and *lunar*]: half-moon-shaped.

SEMINAL and SEMINATION. See under SEMEN.

SEMINARY, n. *sĕm'ĭ-nĕr-ĭ* [L. *semĭnārĭum*, a nursery-garden—from *sēmen*, seed—from *sero*, I sow: It. *seminario;* F. *séminaire*]: a seed-plot; a place of instruction or education; a school; a college. SEM'INARIST, n. *-ĭst*, or SEM'INA'RIAN, n. *-nā'rĭ-ăn*, a priest instructed in the tenets of the Rom. Cath. Chh. in a foreign seminary.

SEMINIFEROUS, a. *sĕm'ĭ-nĭf'ĕr-ŭs* [L. *sēmen*, seed; *fero*, I bear]: secreting and conveying the seminal fluid; in bot., bearing seed.

SEMINOLES, *sĕm'ĭ-nōlz:* tribe of Amer. Indians, originally a vagrant branch of the Creeks, whose name, Seminole, signifies wild or reckless. In 1705 they aided in driving the Appalaches from Florida; and 1817 they joined with the Creeks and some negro slaves who had taken refuge with them, ravaging the white settlements in Georgia, plundering plantations, and carrying off slaves, whom they refused to surrender. Gen. Jackson, who was sent to punish them, took at the time several Spanish forts, and hastened the negotiations which ended in the cession of Florida to the United States. At this cession 1823 the Seminoles engaged to retire into the interior, and not molest the settlers; but as the fugitive slaves continued to take refuge with them, a treaty was made with some of the chiefs, 1832, for removal of the whole tribe w. of the Mississippi. This treaty was repudiated by the tribe at the instigation of Osceola (q.v.), one of their chiefs; and a war commenced against a handful of savages, which lasted eight years, and cost thousands of lives, and ten millions of dollars. The savages made their refuge in the interminable and—except to the initiated—impassable swamps of Florida, whence it was almost impossible to dislodge them. In the end, the remains of the tribe were removed to the Indian Territory, on the borders of Arkansas.

SEMI-NUDE, a. *sĕm'ĭ-nūd* [*semi*, and *nude*]: partially nude; half-naked.

SEMIOLOGY, n. *sē-mĭ-ŏl'ō-jĭ* [Gr. *sēmei'on*, a mark, a sign; *logos*, a discourse]: that branch of medical science which teaches how to judge of all the symptoms exhibited by the human body, whether they indicate health or disease; *symptomatology* is now used in the same sense. SE'MIOTIC, a. *-ŏt'ĭk*, or SE'MIOLOG'ICAL, a. *-ō-lŏj'ĭ-kăl*, relating to the symptoms or signs of diseases. SE'MIOT'ICS, n. plu. *-ĭks*, used in same sense as SEMIOLOGY.

SEMI-ORDINATE, n. *sĕm'ĭ-ŏr'dĭ-nāt* [*semi*, and *ordinate*]: in *math.*, the half of an ordinate.

SEMIOTIC, SEMIOTICS. See under SEMIOLOGY.

SEMIPALATINSK, *sā-mē-pâ-lâ-tĭnsk':* extensive Russian province in central Asia, bounded e. and s. by Tomsk, the Chinese empire, and Turkestan; 184,631 sq.m. It is traversed by several mountain chains. Its topography is little known. The chief rivers are the Irtish, Ili, and

Chui; and among the lakes are Lake Zaisan (80 m. long, 10-20 wide, shallow, but with depth for steam-navigation), Issik-Kul, Ala-Kul, and Balkash. The country is rapidly drying up. Cattle form almost the sole wealth of the inhabitants, though the precious metals, with lead and copper, are found. Steamers ply on some of the great rivers and lakes.—Semipalatinsk, the cap., on the left bank of the Irtish, lat. about 50° 15′ n., is the seat of an imp. transit-trade.—Pop. province, about 700,000.

SEMI-PALMATE, a. *sĕm′ĭ-păl′māt* [*semi*, and *palmate*]: in *zool.*, having the feet only partly webbed down the toes.

SEMIPED, n. *sĕm′ĭ-pĕd* [L. *semi*, half, and *pes* or *pedem*, a foot]: a half foot—applied to verse. SEMIPEDAL, a. *sĕm-ĭp′ĕ-dăl*, containing half a foot.

SEMI-PELAGIANISM, *sĕm′ĭ-pē-lā′jĭ-an-izm:* modification, as the name implies, of the doctrine of the Pelagians as to the powers of the human will, and as to the effects to be attributed to the action of the supernatural grace of God, and of the divine decree in the predestination of the elect. The Pelagians (q.v.), discarding altogether the doctrine of the fall of Adam, and the idea that the powers of the human will had been weakened through original sin, taught that man, without any supernatural gift of the Spirit of God, is able, by his own natural powers, to fulfil the entire law, and to do every act necessary for attainment of eternal life. The condemnation of this doctrine by several councils early in the 5th century is capable of various constructions; and has been urged by some to the extreme of denying altogether the liberty of man, and converting the human will into a merely passive instrument, whether of divine grace on the one hand, or of sinful concupiscence on the other. The writings of St. Augustine on this controversy have been differently construed by the different Christian communions (see PELAGIANISM); and the same diversity of opinion existed in his own day. Among those who, dissenting from the extreme view of Pelagius, at the same time did not go to the full length of the Augustinian writings in opposition to Pelagius, were some monks of the s. provinces of Gaul, especially of Marseille, whence their school was called Massilian, from the Latin name (*Massilia*) of that city. Of these leaders, the chief was a priest named Cassian, who had been a deacon at Constantinople. Of the system which he propounded, without going into the curious and interesting details, it is enough to say that it upheld the sufficiency of man's natural powers only so far as regards the first act of conversion to God and the initial act of man's repentance for sin. Every man naturally possesses the capability of beginning the work of self-conversion; but for all ulterior acts, as well as for the completion of justification, the help of God's grace is indispensable. The Semi-Pelagian doctrine is often confounded with that of the

Molinistic (see MOLINA) school of Rom. Cath. theology; but there is one essential difference, viz., that the latter persistently maintain the necessity of grace for all holy acts, even for the beginning of conversion; though they are generally represented as agreeing with the Semi-Pelagians as to the mode of explaining the freedom of the human will acting under the influence of divine grace. The chief writers in the controversy were Prosper, Hilary, and Fulgentius; and the question was referred to Celestine, Bp. of Rome 431. It continued to be agitated in the West for a considerable time. Faustus, Bp. of Riez, toward the end of the 5th century, revived the error; and it was condemned in a council at Arles 475, and in a synod (the second) at Orange (Arausio) 525, and again in the third council of Valence 530.

SEMI-PENNIFORM, a. *sĕm'ĭ-pĕn'nĭ-fawrm* [L. *semi*, half; *penna*, a feather; *forma*, shape]: in *anat.*, applied to certain muscles bearing some resemblance to the plume of a feather.

SEMIPLENA PROBATIO, *sĕm'ĭ-plē'nâ prō-bā'shĭ-ō*, in Scotch Law: that kind of half-proof, half-suspicion—a species of *prima-facie* evidence—which when admitted by the court in a few doubtful cases was eked out by the oath of the party, called an Oath in Supplement. The Oath in Supplement is now in effect discarded.

SEMI-QUADRATE, n. *sĕm'ĭ-kwŏd'rāt* [*semi*, and *quadrate*], or SEM-QUARTILE, n. *kwawr'tĭl* [*semi*, and *quartile*]: in *astrol.*, the aspect of two planets when distant from each other 45° or half a quadrant.

SEMIQUAVER, n. *sĕm'ĭ-kwā'vĕr* [*semi* and *quaver*]: in *music*, a note equivalent in value to $\frac{1}{2}$ of a quaver, $\frac{1}{4}$ of a crotchet, $\frac{1}{8}$ of a minim, or $\frac{1}{16}$ of a semibreve. SEMIQUAVER, v. to sound or sing in semiquavers.

SEMIQUIETISM, *sĕm'ĭ-kwī'ĕt-ĭzm:* form of mystical asceticism which, while it adopts the theoretical principle that the most perfect state of the soul is that of passive contemplation, and denies, in certain conditions of the soul, the necessity of prayer or other active manifestations of virtue, yet maintains the incompatibility of this passive contemplation with any external sinful or sensual action. The Semi-Quietists thus differed from the grosser sectaries referred to under QUIETISM.

SEMI-QUINTILE, n. *sĕm'ĭ-kwĭn'tĭl* [*semi*, and *quintile*]: in *astrol.*, the aspect of two planets when they are distant from each other 36°.

SEMIR'AMIS. See ASSYRIA.

SEMI-SAVAGE, n. *sĕm'ĭ-săv'āj* [*semi*, and *savage*]: one who is half-savage; one imperfectly civilized.

SEMI-SEPARATISTS, n. *sĕm'ĭ-sĕp'a-ra-tĭsts:* in *chh. hist.*, name given in the 17th century to certain persons who would listen to the sermons of clergymen of the Established Church, but would not be present during the prayers.

SEMI-SEXTILE, n. *sĕm'ĭ-sĕks'tĭl* [*semi,* and *sextile*]: in *astrol.,* the aspect of two planets when they are distant from each other 30°.

SEMI-TERTIAN, a. *sĕm'ĭ-tĕr'shan* [*semi,* and *tertian*]: compounded of a tertian and quotidian: N. a low fever; a kind of ague.

SEMITIC, a. *sĕm-ĭt'ĭk,* or SHEMITIC, a. *shĕm-ĭt'ĭk:* pertaining to *Shem,* son of Noah, or to his time of his descendants (see SEMITIC LANGUAGES; SEMITIC NATIONS). SEMITE, n. *sĕm'īt,* descendant of Shem. SEM'ITISM, n. *-ĭt-ĭzm,* one of the peculiar forms of the Semitic languages (see SEMITIC PLURAL). *Note.*—In Hebrew, the name from which the adjective is derived is spelled *Shem;* but, as in many other cases, the *sh* of the original was transformed by the Septuagint into *s* (see SHIBBOLETH); hence, through the influence of the modern versions that have in this respect followed the Septuagint, the form *Semitic* is more current than *Shemitic.*

SEMITES: a name given by J. G. Eichhorn in 1787 to a group of nations closely allied in language, religion, manners and physical features, who are represented in Gen. x. as descended chiefly from Shem, a son of Noah. Their habitat is Abyssinia, Arabia, Palestine, Phœnicia, Syria, and the countries of the Euphrates and Tigris. The Semites as a race have a fine physical organization, are mentally quick, clever, but not inclined to change. They have been distinguished by a brilliant imagination and love of the beautiful, but have not shone in philosophy or in science. Their literature has neither epic nor dramatic poetry worth notice. Almost their only arts are the sculpture of Assyria, the exquisite glass and pottery, and the textile fabrics and embroidery of the Phœnicians. Impatient of restraint, the Semites have not by political aptitude welded together themselves or others into large, compact and enduring commonwealths. They have made their mark on the world in the Phœnician commerce, which visited even the Atlantic shores of Spain and France and drew tin from Britain; in the Phœnician colonies, which, dotting all the coasts and many islands of the Mediterranean sea as far as Cadiz, and the coast of Asia as far as India, dispensed manufactures, developed primitive navigation and stimulated industry, trade and ingenuity; in the Carthaginian empire within Europe and Africa; in the dissemination of alphabetic writing, whereof the Phœnician form was the mother of the European and of most Asiatic alphabets, while the alphabet of the great Sabæan kingdom, or of the great and still more ancient Minæan kingdom in Arabia, is apparently the oldest of all aphabets hitherto discovered; in the Babylonian and Assyrian empires; in the Hebrew Bible and the Jewish religion; in the New Testament and the Christian religion; in the Koran and the Mohammedan religion; in the Mohammedan conquests and empire; and in the preservation of culture thereby during the Dark Ages and the Middle Ages.

SEMITIC LANGUAGES, *sĕm-ĭt'ĭk:* general name of a number of dialects, supposed at one time to have been spoken by the descendants of Shem. The term is of recent origin (Schlözer, Eichhorn), and a misnomer; for, in the first place, not all the nations derived in Genesis from Shem spoke an idiom akin to those understood by the term Semitic (e.g., the Elamites, Lud, etc.); and, on the other hand, Canaan and Cush, whose Semitic speech is undoubted, are there traced to Ham. S. L., however, as a 'conventional appellation,' is still the best of all the general terms hitherto proposed (Arabic; Syro-Arabic, analogous to Indo-Germanic).

The family of S. L., which spread originally over Canaan (Phœnicia and Palestine), Assyria, Aram (Syria, Mesopotamia, Babylonia), and Arabia, and later over part of Asia Minor and the Punic northern coast—i.e., from the countries on the Mediterranean to the Tigris, and from the Armenian Mountains to the s. coast of Arabia—may broadly be divided into three principal classes: 1. The Aramaic or Northern (n.e.) dialect, comprising chiefly the so-called Chaldee and Syriac; 2. The Southern, the chief representative of which is the Arabic, closely allied to whose older (Himyaritic) form is the Ethiopic; 3. The Middle, or principally Hebraic, to which belong also the languages of the other Palestinian inhabitants, those of the Canaanites and Phœnicians above all. The difference between the Middle and Northern branches is less sharply marked than between the Middle and the Southern or Arabic.

Before treating of them individually, we consider their general position among other languages; and principally the salient points of difference between the Semitic and that other most important family, Indo-European or Aryan languages. First, then, we notice the preponderance given in Semitic to the consonants in distinction from the vowels. The consonants are indeed the basis and the body of its words. The vowels are more or less accessories, modifying, fixing, making precise the meaning, but never themselves containing it, while in the Indo-European languages the root itself consists generally of a combination of vowels and consonants. A further peculiarity is the prevailing 'triliteralness' of Semitic roots in the advanced stage in which we now know them. The Indo-European languages derive their wealth from the logical law of their composition of roots, of verbs, and particles; the Semitic add to their store in phonetically multiplying their sounds: either by splitting, as it were, their single consonants into two or more, through reduplication of radicals, or by adding new consonants to the primary root, which is thus developed often from a monosyllabic (for by far the greatest number of Semitic roots consisted primarily of two consonants only, to which a third was generally added at a later period) into a root of five letters. Compound words are of utmost rarity both in the noun (except proper names) and in the verb, and they never consist of combined roots of verbs and particles, but of verbal and nominal roots. Regarding the formation of cases, tenses, and all those

other grammatical changes of noun and verb which, in the Indo-European family, are wrought—as far as the verb or noun itself is concerned—almost exclusively by suffixes, while the radical vowel changes merely according to euphonic rules within its own limited sphere, the Semitic languages principally and chiefly work their flexions by a change of vowels within the radical consonants, leaving the latter themselves intact. Only when these changes suffice no longer for the more elaborate modes of speech and thought, supplementary letters and syllables are sought in aid, and a certain small number of prefixes or affixes represents the vast and varied groups of little words (amounting at times to whole phrases) of the Indo-European. The Semitic languages are also, if poorer, less complicated in forms than the former family. There are only two genders—which, however, are distinguished also in the second and third persons of the verb—and two principal tenses. These are strongly marked by the position of the personal pronoun, represented by a suffix in the so-called perfect and by a prefix in the so-called aorist or imperfect (future). The former expresses the finite, the completed action, the fact; the latter, the incompleted action, the thought, that which is becoming, growing into a fact. One of the most curious features is the sudden change that may be produced in the two by a certain prefixed conjunctive-consonant. Perfect then becomes future, and *vice versâ*. Declension, in the Indo-European sense, exists, if at all, in an extremely limited sense in Semitic. The juxtaposition of two words (with slight vowel-changes) forms the genitive, while the other cases (in the Hebraic at least) are formed by prepositions. The oblique cases of pronouns are indicated by suffixes. The syntax is of the crudest and simplest kind: a mere stringing together of sentences without any particular attempt at logical and methodical arrangement of periods, according to their temporary superior or inferior relation to the subject matter.

Another most important distinction between the two families is formed by what has been called their lexical difference, i.e., the lack—except in a few isolated cases—of any correspondence or identity in their individual words. Most of those words which show a similarity either have been adopted at a late period, or they simply fall under the category of onomatopoetic words (words imitating the sound of the object expressed, and therefore showing in all cases greater or smaller affinity to the original sound); or, again, words in which the common type of human language would involuntarily, and under all circumstances, connect a special meaning with a special sound, and would, therefore, be more or less identical in all idioms. Of words introduced into European languages by Semitic (Phœnician) traders may be instanced, *kanua* = cane, *gamal* = camel, *mor* = myrrh, *kezish* = cassia, *ahelim* = aloe, *nerd* = nard, *carkon* = crocus, *sappir* = sapphire, *sak* = sack, etc. Of onomatopoetic terms, *lakak* =(Skr. *lih*) to lick, *charat* (Skr. *charidan*) = to grate, scratch, *galal* = to roll, *parak* = to break, etc. On the other hand, words have crept into

Semitic from foreign languages; e.g., the Egyptian, *ior*, *iero*, *iaro*, river, Nile, is found as *yeor* in Hebrew, *pardes* (Heb.) paradise, is Persian, *kop* (Skr. *kapi*) is the Heb. for ape, *karpas* (Skr. *karpâsa*) = wool, cotton, etc.

As regards the age of the family of Semitic languages, it is matter of great doubt whether or not they were developed earlier than any other, e.g., the Indo-European. The monuments that have survived are not sufficient for us to form a final judgment as yet. It stands to reason, however, that a development may have taken place simultaneously and independently in the idioms of other nations. The notion long cherished (and still upheld by a few isolated speculators) that Hebrew was the original language of all mankind till the episode of the tower of Babel, may here be passed over without remark. See PHILOLOGY.

We now endeavor to draw an outline of the relation of the Semitic languages among themselves, and to cast a rapid glance at their individual characteristics and history, referring for fuller details to the titles of special branches indicated. Although the Semitic languages are clearly sister dialects, their relationship is far from being so close as, e.g., that of the different Greek dialects. Thus Abraham, belonging by his descent to a people of Semitic tongue, and coming from a country where Semitic was the general language, at his arrival in his new place of abode, inhabited by Semites, was considered, and considered himself, a foreigner to a much greater extent than would have been the case had a Greek emigrated from one part of Greece into another. It would be more fit perhaps to institute a comparison between the different Semitic dialects and the Germanic languages among themselves: German, Dutch, Danish, Swedish, Norwegian, etc.; or the Slavonic idioms: Lithuanian, Lettish, Russian, Polish, Bohemian. But even these are not so far removed from each other as the Semitic idioms. What the latter have in common are those grammatical and other characteristics indicated above, and the *root-words* themselves, which nearly everywhere have the same original signification; only that in this respect the Arabic shows by far the largest development of meanings out of the single roots, and consequently an unparalleled wealth of derivatives. Yet it must not be forgotten that our relics of ancient Hebrew are scanty, and that the Arabic has remained a living language until our day, and has, through Islam, spread further than any ancient and perhaps even modern language.

Regarding the vexed question as to which of the Semitic languages is the oldest, it must be confessed that no positive result has yet been attained. For though the oldest palpable monuments of Semitic have survived in Hebrew, while our earliest documents in Aramaic date from Cyrus, and those in Arabic, even centuries after Christ (Himyaritic, Ethiopic, 4th c.; northern Arabic, 6th c.), yet we cannot now decide which of these has preserved the type of the original mother-tongue most intact. It sometimes happens that vast internal movements, or a series of events in the history of a people—wanderings, wars, and

the like—change, quicken, and develop its language even to decay, before it has had time to beget a literature. When this time does arrive, we meet already with all the traces of this decay in imperfections, corruptions, and archaisms of form. Thus, the Hebrew of the Bible, i.e., the most ancient form in which it has survived, offers more grammatical analogies (in incomplete structure, inflection, etc.) to the modern than to the ancient Arabic, which lasted in its primitive purity and fulness of form as long as the simple life of the dwellers in the desert was not broken by those events which upheaved, from the time of Mohammed, their whole existence, and brought them in closest and most violent contact with other nations of other tongues. Then that process of decomposition, or phase of negligence and corruption, set in, which resulted in the looseness exhibited by modern Arabic. It thus reached the downward stage of the Hebrew of the Old Test. at ever so much later a period. Arabic classical literature thus exhibits, compared with the Hebrew, and even more with the Aramaic —which we meet in a worse state of aged and crippled organism and stunted form—about the same vigor, freshness, and fulness of form and structure, which the Skr. exhibits among the Indo-European or the Gothic in the narrower circle of the Germanic dialects. With all this, however, we cannot absolutely decide in favor of the Arabic as the nearest approach to the original type. The phase in which it enters into our historical horizon may be as far removed from it even as the Aramaic, perhaps further. Its hasty individual development may have quickened more radical changes than even the decaying or decayed other branches present. So that, as we said, for the present at least, the question of priority must remain open. We shall, however, allot the first place to the second or Southern Semitic (Arabic) class, simply because of its copiousness of words and development of forms. A faint trace of its peculiarity of article (*al*) is supposed to be found in Gen. x. 26 (*Almodad*); but this seems fallacious, considering that the Hebrew article must have been originally the same, and the word may simply exhibit the ancient Hebrew form. In the golden epoch of Hebrew literature, Arab culture does indeed seem to have stood in high renown—Solomon's wisdom is likened unto that of the Arabs, Queen Sheba is an Arab queen, and Job's friends are Arabs. On its peculiar history and development, however, we cannot here dwell. (See ARABIAN LANGUAGE AND LITERATURE.) Suffice it to observe generally that Arabic is not only the richest of Semitic, but one of the richest of all languages, with its more than 6,000 word-roots and about 60,000 words; while the Hebrew has about 2,000 word-roots and 6,000 words. The 22 consonants of the Aramæans, and the 23 of the Hebrews, have been augmented into 28 with the Arabs They further have twice the number of the Hebrew regular conjugations, in which, again, the latter exceed the Aramaic by one. The same abundance is noticeable in the Arabic tenses, declensions, etc. The general wealth of this language, however, will be best appreciated from its pos

sessing about a thousand different terms for a sword, and a proportionate number of words for lion, serpent, and the like; while, on the other hand, its adaptibility and versatility are shown by one word often possessing a vast number of meanings. Anciently, it had two principal branches: the Himyaritic, spoken in the south, which has perished almost completely (a few partly mutilated inscriptions, recently brought to the Brit. Museum, were published some time ago, and their interpretation has been attempted by Osiander and Levy in the *Germ. Or. Society's Transactions*); and the Koreishite, which, being the idiom of Mohammed's tribe, became *the* paramount Arabic for all times. The Ethiopic (see ETHIOPIA) is by some investigators held to have flowed from the Himyaritic; but from the 14th c., the Amharic dialect (also Semitic, but with little capacity for writing purposes) has superseded the Ethiopic almost completely.

The North Semitic or Aramaic, to which we now turn, is the language of the whole district between the Mediterranean and the Tigris, s. of the Taurus, n. of Phœnicia, the Israelitish territory, and Arabia. Here we have again to distinguish between Syria Proper, Mesopotamia (between Euphrates and Tigris), and Babylonia (s. of Mesopotamia), whither the Israelites were carried by Nebuchadnezzar. Yet, with respect to Babylonia, it can hardly be doubted that another dialect besides the Aramaic was spoken in it. But whether this was 'Medo-Persian' ('like the Assyrian'), or some other 'Turanic' idiom, largely mixed with Semitic ingredients, must remain doubtful until our knowledge of 'Turanian' and our reading of cuneiforms shall have advanced further. There is, however, but one voice among competent investigators, that whatever strange elements the Babylonian and Assyrian languages may contain, they have full claim to be reckoned among the Semitic. The Aramaic in general is, as has been observed before, poorer than the Hebrew in grammatical forms, vowels, etc., besides having a peculiar tendency to blunting its consonants, changing its soft *s* into *d*, *ts* into *t*, *sh* into *th*, and the like. It further does not express its article by a prefix, but by an *Alef*, and it forms its passives, not by change of vowels, but by a special syllable prefixed to the root. The first distinct trace of a difference between Hebrew and Aramaic is seen in Gen. xxxi. 47, where it is found necessary to translate Laban's designation of the stone-heap erected in memory of his peace with Jacob. Although the ancient Babylonians had probably a rich and important literature, yet nothing of it has survived. The so-called Babylonian fragments supposed to have come down in Arabic translations are a mere fiction. All the Aramaic literature which we possess is derived from the Jews, and of very late date The Babylonian exiles, both those who returned to Palestine and those who stayed in the land of their captivity, made Aramaic their habitual language. It was the common tongue of Palestine at the time of Christ, the Hebrew being then chiefly the 'holy language'—i.e., the language of temple and synagogue. Thus, the Semitic words used in the

New Test. are one and all Aramaic (Mammon; Raka; Eli, Eli, etc.; Talitha Kumi; Abba; etc.), and the same may be said of the Semitic terms found in Josephus. The oldest remains in this idiom (variously called Hebraisti, Arami, Sursi, Chaldee) are certain portions of the Old Test. (Daniel, Ezra, etc.), the Targums (q.v.), the Mishna (to a certain extent, at least), the Talmuds, and the Midrashim. Idiomatic shades are again observable in these different documents; but while, as a living language, it was spoken and pronounced differently in the different districts of Palestine and Babylon, yet the special subdivisions into special provincial dialects which have been attempted can hardly be said to be correct. From the 2d c., Christian writers, chiefly in Mesopotamia, Edessa, Carrhæ, Nisibis, began to use this language in their writings, principally theological (Translation of the Bible) and dogmatical, but which also treat of medicine, history, philosophy, mathematics, etc. Yet their Aramaic assumed a character so essentially different that, in some respects at least, it became an entirely distinct dialect, viz., Syriac, which, at a later period, assumed also—to make the breach complete—an alphabet of its own (Estrangelo). Many have been the attempts to account for this strange difference (whose very existence was, on the other hand, almost totally denied at one time), but with no satisfactory result. Certain it is that the mere geographical reasons (East and West Aramaic, etc.) do not hold good, and are arbitrary and fallacious. The Syriac, as a living language, ceased to be spoken since the 10th c., and only a few Syrian Christians in Kurdistan and Mesopotamia are supposed to use a kind of vulgar Aramaic. Syriac literature ceased about three centuries later. As the language of the church, however, it is still in use with the Jakobite, Nestorian, and Maronite branches of the Syrian Church. Minor sister dialects of Aramaic are the Samaritan, a corrupt Judæo-Aramaic mixed with Arabic words; the Zabian or Nazaræan (Mandaic); the language of a theosophical sect ('disciples of John the Baptist') standing between the Syriac and Chaldee, and mixed with Persian, but bearing altogether the stamp of an uncouth, ungrammatical, sadly neglected idiom; further, the Palmyrene (Palmyra), which, with a written character closely akin to the square Hebrew, offers but little variations from the Syriac; and finally, the Ægypto-Aramaic, which is found on a few monuments (Stone of Carpentras, Papyri), and probably belongs to Jews who at a late period had immigrated into Egypt, and had adopted the Egyptian religion. Its words are principally Judæo-Aramaic, but with large infusion of foreign elements.

The third principal branch, the Middle Semitic, which comprises Hebrew and Phœnician (Punic)—and all the questions connected with these—are discussed under JEWS and PHŒNICIA (see those titles). See also ARABIAN LANGUAGE AND LITERATURE: ARAMÆA: ETC.

SEMITIC NATIONS, or SEMITES, *sĕm'its:* various nations considered as descendants of Shem. Generally comprised under this name are the Assyrians, the Chaldæans or Babylonians, the Syrians, Phœnicians, Hebrews, Arabs, and Ethiopians: see these several titles. It remains here only to add a few observations on the characteristics ascribed to them all in common, and on their influence on the history and development of humanity. As regards the language, the poverty of the inflections, the well-nigh absolute impossibility of expressing abstract ideas, the general absence of compound verbs and substantives, and the primitive state of the syntax in the Semitic, as contrasted with the wealth and vigor of the Aryan, see SEMITIC LANGUAGES. From this arises, as an almost natural consequence, the general inferiority of Semitic literature—to what we emphatically call 'classical literature.' Certain most important forms of Indo-European poetry, e.g., are completely lacking in the Semitic, such as the epopee and the drama; though, on the other hand, the peculiar ancient form of Arabic poetry—the Kasida—and the grand bursts of pathos found in the religious books of the Hebrews, are vainly sought in Indo-European literature. Again, a primitive state of Law seems to have developed among the Aryan nations, the chief characteristic of which was a recognition, albeit dim, of individual rights, as far as they did not war against the complex unity of the 'State.' With the Semites, in the absence of that talent for organization and conciliation which is so essential a mark of the Indo-Europeans, we find either a patriarchal, an anarchical, or a despotical kind of government. Science and philosophy, in the larger sense of the words, are the almost exclusive property of the Aryans. The inferiority of the Semites in these respects, however, is amply counterbalanced by the sublime place that they take as the ethical teachers of all humanity. How the hard and narrow egotism which, not quite unjustly, is ascribed to them, ever came to bear and ripen those grand moral maxims with which we meet in the earliest Jewish records, and which, wrought up to their purest idealism, form the shining glory of the New Test., is a problem of which some seek the solution in a peculiar *intensity* of character inherent in the Semitic races; while others account for it by direct 'Inspiration' from the living God. The same may be said of that Monotheism which belonged, in the first instance, to the Hebrews out of all the nations of the earth. It is a grave mistake, however, to describe, as Renan does, the Semites indiscriminately as monotheists. Babylon and Assyria, and Syria or Phœnicia, and the ante-islamic Arabs, were neither more nor less polytheistic than the early or present inhabitants of India. And, we may well add, not before the return from the Babylonian exile are the Jews themselves, as a whole nation, to be considered as real monotheists. Only by a slow process through many generations was Israel educated up to the pure monotheism of their early laws and institutes, out of their original idol-worship, and against the tremendous pressure of the world-wide paganism amid which they stood—a single nation

bearing alone the treasure of a pure faith. But ever since that exile, both they, and, from the time of Mohammed, the Arabs, have been the representatives of a more austere and exclusive dogma of the unity of the godhead than a great part of the civilized world has found good to accept up to this day. Both Christianity and Islam, the most powerful religious agents, one for nearly 2000 years, the other for about 1200, are in their origin Semitic; and their influence need not here be enlarged upon. For what we owe to the Semites in the field of industry and inventions, and the civilization which they carried with them wherever they went, see PHŒNICIA. Also, it is to be remembered that the very Alphabet itself is of Semitic origin.

SEMITIC PLURAL: in Semitic languages, particularly Hebrew, a use of the plural where other languages use only the singular. This is particularly the case in terms of space and time—their vastness being conceived as a multiplicity. Thus, certain regions, like Heaven—which, through the influence of the Bible language, is also with us sometimes used *pluraliter*—'Heavens,' the expanse of water; further, the place at a person's head or feet, or even certain limbs of the body (conceived as space), like neck, face, etc.; or, again, periods of times, like youth, age, life, and special *lasting* qualities or states, like barrenness, blindness, mercifulness, and the like, are put in plural number, where the English uses the singular only. It is further applied to might and strength, as consisting originally of a multiplicity of elements of power. This is shown particularly in the word ELOHIM (q.v.), = a Unity of many 'Mights'—i.e., the Supreme Being. The false conclusions as to the plurality of the Divine Persons being proved by this word are refuted by the occurrence of the plural in the word Master (Adon), Lord (Baal), when these stand unmistakably for a single human individual, and are meant to express merely his proprietorship of some object or other.

SEMITONE, n. *sĕm'ĭ-tōn* [*semi*, and *tone*]: in *music*, a 'half-tone'; one of the smallest intervals in the diatonic scale, as E F or B C, in which the ratio is as 15 to 16.—In the pianoforte, the interval between any two notes between which no other note is interposed, as C to C sharp or B flat to B, is a semitone.

SEMI-TRANSPARENT, a. *sĕm'ĭ-trăns-pä'rĕnt* [*semi*, and *transparent*]: half or imperfectly transparent.

SEMI-VOCAL, a. *sĕm'ĭ-vō'kăl* [*semi*, and *vocal*]: half-vocal; imperfectly sounding; pertaining to a semi-vowel.

SEMI-VOWEL, n. *sĕm'ĭ-vow'ĕl* [*semi*, and *vowel*]: a sound intermediate between a vowel and a consonant, as, *l*, *m*, *n*.

SEMLER, *sĕm'lĕr*, JOHANN SALOMO: one of the most influential German theologians of the 18th c., called sometimes 'the father of German rationalism' (see RATIONALISM): 1725, Dec. 18—1791, Mar. 14; b. Saalfeld, where his father was archdeacon. He was educated at Halle; and 1749 went to Coburg as prof. at the gymnasium. In 1751

he was appointed a prof. of theology at Halle, where he taught with great success; and six years later became director of the theol. seminary there. S., early in his student-career, was somewhat of a Pietist, but the prelections of Sigm. Jak. Baumgarten may be said to have revolutionized his religious convictions, and swung him round to rationalism, of which he was the pioneer. S.'s rationalism, however, was always moderate in *degree*, though definite in *kind*. As a thinker, he was deficient in philosophical consistency and breadth of view; as a writer, he had no literary skill or grace; but his works are valuable for their new spirit of historical criticism. As a biblical critic, though not definite and clear in details, he illustrated some principles long overlooked: he distinguished between theology and religion; between the provincial and temporal, and the fundamental and universal in historical Christianity; between individual beliefs, and the public testimony of the combined church in creeds. He recalled the forgotten fact that the traditional canon of Scripture was not set forth by divine authority. The absolute identification of the Bible with revelation, he denied, also the strict theories of a perfect verbal inspiration. Toward the end of his career, he saw the need of a conservative check on the spirit of general criticism which he had aroused.—His principal works are: *Apparatus ad liberalem Veteris Testamenti Interpretationem* (Halle 1773), *Abhandlung von der Untersuchung des Kanons* (4 vols. Halle 1771–75), *De Dæmoniacis* (Halle 1760), *Umständliche Untersuchung der Daemonischen Laute* (Halle 1762), *Versuch einer Biblischen Daemonologie* (Halle 1776), *Selecta Capita Historiæ Ecclesiasticæ* (3 vols. Halle 1767–69), *Commentationes Historicæ de Antiquo Christianorum Statu* (2 vols. Halle 1771–2), *Versuch Christlicher Jahrbücher oder ausführliche Tabellen über die Kirchengeschichte bis auf's Jahr.* 1500 (2 vols. Halle 1783–86), *Observationes novæ, quibus Historia Christianorum usque ad Constantinum Magnum illustratur* (Halle 1784) —See his *Lebensbeschreibung von ihm selbst verfasst* (Halle 1781–2), Schmid, *Theologie Semler's* (1858), and Tholuck in *Vermischte Schriften.*

SEMLIN, *sĕm lēn':* frontier town of Austria, in the Croatian-Slavonian Frontier (till of late the Military Frontier); on a tongue of land at the junction of the Save and Danube, on the right bank of the Danube, opposite Belgrade. Recently the town has been much improved, though even yet a suburb of mud huts thatched with reeds stretches along the Danube. The only noteworthy edifices are the churches, the German theatre, and the Lazaretto (*Contumaz*), the chief quarantine station in the whole of the Military Frontier. At this institution, travellers crossing from Turkey are compelled to remain for a time—sometimes 40 days—in proportion to the violence and proximity of the plague. The principal Lazaretto is here because S. is the great seat of the Turco-Austrian transit-trade, and the principal ferry for passengers from the land of the Moslem to Christendom. Pop. (1880) 9,500 —For a graphic notice of S., see Kinglake's *Eothen.*

SEMMERING, *sĕm'mĕr-ĭng:* mountain on the borders of Styria and Austria, 44 Eng. m. s.w. by w. from Vienna; 4,416 ft. above sea-level. The Vienna Grätz and Trieste railway has been carried across this mountain by a series of ingenious engineering contrivances. See GLOGGNITZ.

SEMMES, *sĕmz,* RAPHAEL: American naval officer; 1809, Sep. 27—1877, Aug. 30; b. in Charles county, Md. In 1828 he entered as midshipman in the U. S. sloop-of-war *Lexington,* and was in the service as passed midshipman and lieut. until 1855, when he attained the rank of commander. In 1858, he was appointed sec. to the Lightnouse Board; but resigned 1861, Mar. 26; joined the naval service of the Confederate States; was sent by Jefferson Davis to N. Y., Conn., and Mass., to visit the principal workshops, and to buy and ship to the south all kinds of munitions of war. On his return he was appointed to command the war-steamer *Sumter,* in which he captured 18 merchant vessels. For the career of Capt. S. until the sinking of his famous ship, the *Alabama,* by the U. S. war-steamer *Kearsarge,* see ALABAMA, THE. Capt. S., with 13 officers and most of his men, was rescued from drowning by the yacht *Deerhound,* and taken to England, where he expected to take command of one of two rams built at Liverpool for the Confederates, but which were seized by the British govt. He returned to America, was included in the final surrender, and was elected judge of probate at Mobile, Ala.; but, being prohibited by the Federal authorities, he was, 1866, appointed prof. of moral philos. in a southern university. He published the *Cruise of the Alabama and the Sumter* (1864); and *My Adventures Afloat* (1869).

SEMNOPITHECUS, *sĕm-nō-pĭ-thē'kŭs:* genus of monkeys, natives of the East, having a very long, slender powerfully muscular, though not prehensile tail. The canine teeth are long, but the molar teeth are more tuberculous than in Gibbons (q.v.) and other allied monkeys, indicating a greater aptitude for vegetable food. With this the structure of the stomach corresponds, which is very remarkable, and different from that of all other animals; consisting of a cardiac pouch, slightly bifid at the extremity; a very wide middle portion, formed of numerous pouches or sacs; and a very long canal, furnished with sacs at its commencement, but simple toward its termination. Prof. Owen has pointed out that these three portions do not correspond to any of the parts of the stomach of a ruminant animal, not exhibiting any such diversities in internal surface. The species are numerous: the Entellus Monkey (q.v.) is one; another is the Negro Monkey (*S. Maurus*) of Java, remarkable for jet-black color and long silky hair.

SEMOLINA, n. *sĕm'ō-lē'nă* [It. *semolino*, a kind of paste r soups—from *semola*, bran—from L. *simĭla*, the finest heat-flour: F. *semoule*, sand-like wheat-meal]: the fine hard parts of wheat rounded by attrition in the millstones; article of food much used in France and Italy; consisting of particles of wheat varying in size from grains of sand to small millet. Only the hard-grained wheats of Spain, Odessa, and s. Italy are adapted for making it; these hard wheats are not easily reduced to flour; and the small particles which escape being crushed by the millstones, and will not pass through the sieves, constitute S. In France, more attention is given to S. than in any other country; and as it fetches a higher price than flour, the skilful miller adjusts his millstones to produce a considerable quantity. The granules of S. are of various sizes, and they are carefully separated by sieves with openings from fine to coarse. A favorite bread made of the coarser kinds of S.—the semoule of the French—is sold in Paris under the name *gruau*. In Italy, S. is used in making polenta, with maize, meal, and millet; in Britain it is used for puddings.

SEMOULE, n. *sĕ-mōl'* [F.]: same as SEMOLINA (q.v.).

SEMPACH, *sĕm'pâch:* small town of Switzerland, canton of Lucerne, 9 m. by railway n.w. of the town of Lucerne, on the e. shore of the Lake of Sempach: pop. little more than 1,000. It is surrounded with walls, now ruinous, and was one of the outposts of the confederated cantons against their Swabian and Austrian assailants in the 14th c.—Under the walls of S. was the second great conflict of the confederated Swiss cantons with Austria. Leopold's army of 4,000 horse and 1,400 foot arrived before S. 1386, July 9, and found itself unexpectedly opposed by the confederated Swiss to the number of 1,300. The nature of the ground being unfitted for cavalry, the knights dismounted and formed themselves into a compact body, which was at once charged by the Lucerners; but the wall of steel was impenetrable, and not a man of the Austrians was even wounded, while 60 of the bravest of Lucerne, with their landamman, fell. The mountaineers were beginning to despair of making an impression on their apparently invulnerable opponents, when Arnold von Winkelried, a knight of Unterwalden, seized with a noble inspiration, rushed forward, grasped with outstretched arms as many pikes as he could reach, buried them in his bosom, and bore them by his weight to the earth. His companions rushed over his body into the breach thus made, slaughtered the armor-encumbered knights like sheep, and threw the remainder into confusion and dismay. The result was a decisive victory for the Swiss, who had lost only 200 men; while the loss of the Austrians was ten times as great, including 600 counts, barons, and knights. The body of Duke Leopold, who had throughout displayed obstinate valor, was found next day buried among heap of slain. The anniversary of this great victory is still celebrated by prayer and thanksgiving on the field of battle.

SEMPER, *sĕm'pĕr*, GOTTFRIED: architect: 1803, Nov 29—1879, May 15; b. Hamburg. He received his early education at Altona and Hamburg, and later studied mathematics, particularly in relation to milit. science, at Göttingen. He studied architecture at the Univ. of Munich 1825–6, and at Paris under Gau 1827–30; then travelled in Italy, Sicily, and Greece. He became prof. of architecture in the Dresden Academy 1834. In Dresden he was architect of the opera-house, the museum and picture-gallery, a synagogue, and other notable buildings, in which he gave expression to his artistic ideas of a classic decorative style. He was implicated in the revolutionary troubles of 1848, and had to flee from Saxony. He was appointed teacher of the principles of decoration in the S. Kensington Museum, London, at its opening 1852, became prof. of architecture at Zurich 1853, and built the new polytechnic school there, besides a hospital, etc.; was called to Dresden 1871 to rebuild the opera house, built by him before his exile, and destroyed by fire 1869. S. was a leader in the practice of polychrome in architecture: his German writings on color, ancient plastic art, etc., have done much to restore the ancient union between architecture, sculpture, and painting. S.'s English lectures, on art in metals and hard materials, are unpublished. His son, HANS S., has written on Tuscan sculpture.

SEMPERVI'VUM: see HOUSE-LEEK.

SEMPITERNAL, a. *sĕm'pĭ-tĕr'năl* [F. *sempiternel*, sempiternal—from L. *sempiter'nus*, perpetual—from *semper*, always]: having beginning, but no end; endless; eternal; everlasting. SEM'PITER'NITY, n. *-tĕr'nĭ-tĭ*, endless duration in the future.

SEMPRE, ad. *sĕm'prā* [It.—from L. *semper*, always]: in *mus.*, ever, always, throughout: used with some other mark to signify that such mark is to remain in force until a new direction appears.

SEMPSTER, n. *sĕm'stĕr* [see SEAM 1]: one who works with the needle. SEMP'STRESS, n. *-strĕs*, a woman who works with the needle. SEMP'STRESSY, n. *-strĕs-ĭ*, the occupation of a sempstress.

SEN: ancient Egyptian town: see ESNE.

SEN, *sĕn*, KESHUB CHUNDER, *kĕsh'ŭb chŭn'dĕr*, Babu: leader of the Brāhmo-somāj (q.v.) or native theistic society of India: 1838–84. He was of the Vaidya or merchant caste, and, while a student in the Presidency College, Calcutta, discarded much of his ancestral religion. Joining the Brāhmo somāj, he gave it new impetus and form. Its first stage, under its original founder, Rammohun Roy (d. 1833), has been termed the Vedantic, because, while rejecting idolatry, it regarded the Vedas as infallible, and favored transmigration and the doctrine of *Nirvâna*. The second stage, named the Puranic, followed the Purana sacred books and practice in worshipping the Godhead alone, and teaching the separate being of God and the human soul; it dates from about 1840, when Babu Debendra Nath Tagore became leader of the progressive

party in the society. The third or eclectic stage was introduced by Babu Sen, and took distinct form, with secession of conservatives, when, 1865, he demanded on behalf of his party that badges of caste be discarded, men only of pure life employed in religious services, and tolerance be entertained toward other religions—Brahmoism to be an eclectic and universal faith. The Bible was accepted in common with other sacred books, and the Lord Jesus was received as the wisest and best of men; but incarnation and mediation were rejected as inconsistent with human equality and freedom. In a remarkable lecture at Calcutta 1879, Sen said, 'Christ rules British India, not the British government. If unto any army appertains the honor of holding India for England, that army is the army of Christian missionaries, headed by their invincible captain, Jesus Christ.' Doctrines especially recognized by the society are the Divine Fatherhood and Presence, Providence, the Communion of Saints, and Immortality. Since 1879, a fervent devotional spirit has been developed; but, with it, a singular spiritist doctrine and practice of the 'communion of saints;' pilgrimages are made to rooms where, not outwardly, but in the soul of the devotee, the spirits of Moses, Socrates, scientific men, and certain Hindu saints are supposed to give audience annually, each on a certain day. New ceremonies, and new forms of Christian ordinances, have been introduced. Monogamy, the marriage of Hindu widows, female education, and temperance are advocated. A theol. institution, a library, a large school for boys, and many periodicals were established before the death of Babu Sen.

SENAAR, or SENNAAR, *sĕn-nâr'* (properly SENNAR); anciently known as the *Island of Meroe, mĕr'ō-ē:* country of e. central Africa, bounded n. and n.e. by Upper Nubia, e. and s.e. by Abyssinia, s. and s.w. by Soudan or Nigritia, and w. by the Bahr-el-Abiad or White Nile, which separates it from Kordofan; extreme length 350 m.; average width 120 m.; 40,000 sq. m. It consists of two physically distinct divisions, one well wooded and well watered, called Jezirat el-Jesirat ('Isle of Isles'), between the Blue Nile and the Rahad; the other, the 'island' of Sennar proper, between the two main rivers, which is almost a level plain, though beyond Sennar, the old capital, it rises into rocky ridges and elevations of several thousand feet. The level plain has an alluvial soil which would, after the periodical rains, if well cultivated, yield rich crops of cotton, tobacco, maize, pulse, sesame, and durra, though the last is the principal product. The forests of the wooded portions include the tamarind tree, from which bread is made, ebony, dye-woods, many valuable gum-trees, including the gum-arabic, iron-wood, acacias, the boabab-tree, and the deleb-palm. Elephants, giraffes, the two-horned rhinoceros, lions, panthers, apes, and antelopes abound in them, and the hippopotamus and crocodile infest the rivers. Among domestic animals are the camel, horse, ass, ox, buffalo, used as a beast of burden and for riding, sheep with short silky fleece, goat,

cat and dog, and pig, the last not found further south than S. The chief occupations of the people are stock-raising, agriculture, and trade, gold, hides, ivory, horses, durra, sesame, gums, and slaves being exported to Egypt and Abyssinia; there is also some manufacturing of cotton-goods, pottery, gold, silver, and iron-work, matting, camel's saddles, and sandals. The towns or villages are on the banks of the Bahr-el-Azrak or Blue Nile. Moslemism is the prevailing religion. S. was formerly an independent negro state, but in 1822 it came under the authority of Ismail Pasha, and has ever since been subject to Egypt. Pop. about 300,000.

SENATE, n. *sĕn'āt* [L. *senātus*, council of the elders, the senate—from *senex*, old, aged: F. *sénat*, a senate]: one of the deliberative and legislative assemblies of a state; in *anc. Rome*, the deliberative assembly of the Roman people, possessing supreme legislative powers (see ROME): in the *United States* and in *France*, the upper house of the legislature (see below): in a wider sense, the legislature. There are Senates with various functions in the Hanse towns, Russia, Belgium, Italy, and other countries. The governing body of the Cambridge Univ. (q.v.) is the Senate: the same term, or more specifically SENATUS ACADEMICUS, is used for one of the governing bodies in the Scottish universities (see UNIVERSITY), comprising principal and professors: in the German universities also the ordinary professors, taken collectively, constitute the Academic Senate, and administer their affairs, under governmental superintendence.

The SENATE OF THE UNITED STATES is the upper chamber of the federal legislature. The S. has important functions executive and judicial, in addition to its functions as a legislative chamber. Two members are sent to the Senate from every state by vote of the state legislatures. They must be not less than 30 years of age and must have been citizens of the United States for 9 years. They must be residents of the state from which they are chosen. Besides its legislative functions the S. has power to ratify or reject all treaties made by the President with foreign powers, two-thirds majority being necessary to ratify. The S. can confirm or reject all appointments to office made by the President. The S. constitutes a High Court of Impeachment, the maximum judgment being removal from office and disqualification. The House of Representatives has the sole power of impeachment. No state can be deprived of equal representation in the senate (i.e., 2 senators) without its own consent. The vice-pres. of the United States is president of the S., but has no vote, except a casting vote when the S. is evenly divided. The S. has never adopted any rule of 'closure' or 'previous question' to terminate debate on any question. Executive sessions of the S. are held in secret, and the S. has the power of expelling a senator who betrays the secret of an executive session.—

See, for further detail, CONGRESS, UNITED STATES, CONSTITUTION OF THE UNITED STATES (Sec. 3, etc.). SENATOR, n. *sĕn'ă-ter*, a member of a senate. SEN'ATORSHIP, n. the office or dignity of a senator. SEN'ATORIAL, a. *-tō'rĭ-ăl*, pertaining to a senate or senator; in *U. S.*, entitled to elect a senator. SEN'ATO'RIALLY, ad. *-lĭ*. SENATE-HOUSE, n. the place where a senate meets.

SEND, v. *sĕnd* [Icel. *senda;* Dan. *sende;* Sw. *sända;* Goth. *sandjan;* Ger. *senden*, to send]: to throw or cast; to impel; to hurl; to thrust; to dispatch; to direct to go and act; to grant, as from a distant place; to cause to be; inflict. SEND'ING, imp. SENT, pt. and pp. *sĕnt*. SEND'ER, n. *-er*, one who sends. TO SEND AWAY, to cause to depart; to dismiss. TO SEND FOR, to request by message to come or to be brought. TO SEND FORTH, to put or bring forth; to produce; to emit.

SENDAI: town in province of Rikuzen, Japan; 200 m. n. of Tokyo. It is the capital of the Miyagi prefecture, which covers all of Rikuzen, and part of Iwaki province. The city is the headquarters of the 2nd army division. It is a missionary centre of considerable importance. Pop. 1909, about 100,000.

SEN'ECA LAKE: one of a range of narrow lakes in w. N. Y.; 37 m. long from n. to s., and 2 to 4 m. wide; 441 ft. above the Atlantic, 630 ft. deep; and is very rarely frozen over. It is navigated by steamboats from its head to the village of Geneva at its mouth, and discharges by the Seneca and Oswego rivers into Lake Ontario. It takes its name from the Seneca Indians, one of the Six Nations. Watkins Glen is near the head of the lake.

SENECA, *sĕn'ē-ka*, LUCIUS ANNÆUS: philosopher and statesman, and brilliant writer: about B.C. 3—A.D. 65; b. Corduba (Cordova), Spain; second son of Marcus Annæus Seneca, the rhetorician. When a child he was brought by his father to Rome, where he was initiated in the study of eloquence. He cared more, however, for philosophy, in which his first teacher was the Pythagorean Sotion, whom he afterward left to follow Attalus the Stoic. He travelled in Greece and Egypt; and, in obedience to his father's wishes, he pleaded in courts of law; but notwithstanding his forensic triumphs, he left the bar from fear of Caligula's jealousy. On entering into public life, he filled the office of questor, and had already risen high in the favor of Emperor Claudius, when, being accused of an adulterous connection with Julia, daughter of Germanicus, and wife of Vinicius, he was exiled to Corsica, A.D. 41, where he remained eight years, deriving from philosophy and authorship what consolation he could, while incessantly complaining with unphilosophic querulousness, and appealing to the emperor for pardon. When Claudius married his second wife, Agrippina, Seneca was recalled by her influence, raised to the pretorship, and appointed instructor of her son Nero, then 11

years old. For several years the govt. was practically in the hands of Seneca, and of Burrus, pretorian prefect; and was administered with rare wisdom, energy, and humanity. But Nero, at the death of Burrus, his military tutor, gave way to his depraved passions with a force which Seneca could not control. All Seneca's influence over his pupil was lost, though he profited by his extravagant bounty to such a degree that his accumulated wealth amounted to 300,000 sesteria, or to about $12,000,000. Nero soon began to look with envious eyes on this fortune; and Seneca, to avert dangerous consequences, offered, with much tact, to refund to the emperor his gifts, and begged leave to retire on a small allowance. This Nero declined; and Seneca, under pretense of illness, shut himself up, and refused to appear in public. Nero then attempted to have him poisoned, but failed. A short time afterward, Antonius Natalis, when on his trial for participating in the conspiracy of Piso, implicated Seneca as one of the conspirators. This mere charge was enough to fix Seneca's guilt. He was sentenced to put himself to death. His wife, Paullina, declared her resolution to die with him, and, in spite of his remonstrances, accompanied him into the bath in which, according to his own choice, he was to be bled to death. The emperor, however, would not allow Paullina to die, but removed her from her husband, who gradually expired.—Seneca's extant writings are mainly on moral subjects, and consist of Epistles, and of treatises on Anger, Consolation, Providence, Tranquillity of Mind, Philosophical Constancy, Clemency, The Shortness of Life, A Happy Life, Philosophical Retirement, and Benefits. He also speculated on physical phenomena, and wrote seven books entitled *Quæstiones Naturales*, in which he is thought to have anticipated some notions regarded as principles in modern physics. Ten tragedies, ascribed to him by Quintilian, and generally included in editions of his works, have also come down to us; but whether he is their author remains doubtful. They were not intended, certainly not adapted, for the stage. They are overcharged with declamation, and lacking in dramatic life. Of his genuine prose writings, modern opinion takes a divided view; some critics praising his practical sagacity, others finding him destitute of speculative reach. It is perhaps a significant fact that he is admired by French scholars and disparaged by German. His severer critics find his style declamatory, artificial, seeking dazzling effects of form, to the neglect of thought. But his writings have some undeniable excellences. His essays on conduct have been called Stoical sermons; and some students have found in their moral precepts anticipations of Christian ethics. One of the best editions of the prose works is the Bipontine, 1809; of the tragedies, that of Bothe, 1819.

SEN'ECA FALLS: village in Seneca co., N. Y.; on Seneca river, the S. and Cayuga canal, and on the New York Central and Hudson River railroad; 2 m. w. of Cayuga Lake, 10 m. e. of Seneca Lake, 16 m. w. of Auburn, 62 m. e.-by-s. of Rochester. The river falling here 50 ft. affords excellent water-power, which has been developed by manufacturing interests, including the making of fire-engines, hook and ladder trucks, woolen goods, pumps, grist mills, furniture, and machinery. S. F. is in a thriving agricultural and fruit-growing region. Dairy and farm products, and fruit constitute the leading trade. It is connected by trolley with Cayuga Lake park, Waterloo, and other suburbs. S. F. has a high school and academy, business college, public library, several graded schools and churches, newspapers, and banks. Pop. (1900) 6,519; (1910) 6,588.

SENECAS, *sĕn'ē-kaz:* tribe of Indians belonging to the confederation known as the Six Nations, and from the early history of the country living in w. N. Y. The name by which they called themselves is said to mean 'People of the Great Hill,' and is thought to have been derived from a tradition that their ancestors rose from the soil on the elevated ground at the head of Canandaigua Lake. Senecas is a corruption of 'Sinnekaas,' the name given to the tribe by the early Dutch settlers of the region. The other nations of the confederacy were located further e. and were less exposed than the S. to attacks by unfriendly tribes. Though they had only 8 of the 50 sachems, the S. supplied the two leading war-chiefs, furnished about one-half of the warriors, and were the most aggressive element of the Six Nations. Their language closely resembles that of the Cayugas, with whom they were long united. The early French explorers found the S. in the region roughly bounded by the lakes Canandaigua, Seneca, Cayuga, and Ontario; but the S. afterward pushed their conquests w. and greatly enlarged their domain. For a long period they were hostile to the French. In 1784, a treaty of peace was made with the U. S. govt. The S. transferred to the govt. a large part of their land in the Genesee valley, and removed to the vicinity of Lake Erie and the Allegheny river. They assisted the govt. in defending the Niagara frontier in the war of 1812. A few years ago they changed their form of govt. from the ordinary rule by chiefs, and adopted a constitution which provides for a council of 16 members, a pres., and a judiciary. Their records are kept in writing. Missions have been established, and many of the people have embraced the Christian faith. They have schools, and speak both the English and their own tongue. Their reservations, in Cattaraugus co. and on the Allegheny river, comprise about 50,000 acres of land, and they receive an annuity from the state and from the national govt. There are many prosperous farmers. The tribe numbered (1900) about 3,000.

SENECIO, *sē-nē'shĭ-ō:* genus of plants of nat. order *Compositæ*, sub-order *Corymbiferæ*, having a hairy pappus, a naked receptacle, and a cylindrical involucre of linear equal scales, with a few smaller scales at their base. The species are very numerous; annual, perennial, and half-shrubby plants, natives chiefly of temperate and cold parts of the world, the half-shrubby species being from the warmer latitudes. Some of the species are commonly known as Groundsel (q.v.) and Ragwort (q.v.). *S. Saracenicus* has undivided lanceolate leaves, and was formerly in repute as a vulnerary. The FIREWEED of N. America is *S. hieracifolius*. It receives its popular name from its appearing abundantly in some regions, wherever a part of the forest has been consumed by fire. Many species of S. have a strong disagreeable smell. A few are rather ornamental as flowers.

SENEFFE, or SENEF, *sĕh-nĕf':* town in the province of Hainault, Belgium, about 11 m. n.w. of Charleroi; pop. between 3,000 and 4,000. It is the centre of a district of pottery and glass manufactures. It is notable chiefly for its proximity to the battle-field on which William of Orange (III. of England), at the head of the forces of the coalition against France, was defeated, after a bloody contest, by the Great Condé, 1674, Aug. 11. In William's army there were four lieutenants—Montecuculi (q.v.), Duke Charles of Lorraine, the Prince of Waldeck, and the Prince of Vaudemont, the first three subsequently prominent as military commanders. Of the allied forces of 60,000 men, the Dutch lost 5,000 to 6,000 men, the Spaniards 3,000, and the Imperialists 600; while the French army, which entered into the conflict 30,000 strong, could muster scarcely 20,000 after their victory.—Under the walls of S., Moreau, 1794, defeated the Austrians.

SENEGA, n. *sĕn'ĕ-gă*, or SENEKA, n. *sĕn'ĕ-kă*, or SNAKE ROOT [probably so called from the *Seneca* Indians]: dried root of *Polygala Senega* (see POLYGALA). The following are its characters: 'A knobby root-stock, with a branched tap-root of about the thickness of a quill, twisted and keeled; bark yellowish-brown, sweetish, afterward pungent, causing salivation; interior woody, tasteless, inert.' S. is a powerful and trustworthy stimulating expectorant, and may be advantageously prescribed in advanced stages of chronic bronchitis and pneumonia, especially in aged or debilitated patients. It is also a valuable remedy in prolonged hooping-cough, and in latter stages of croup and of bronchitis in young children. The preparations are the Infusion and the Tincture. For children, the powdered root in doses of ten grains is recommended.

SENEGAL, *sĕn-ė-gawl'*, RIVER (called by the natives *Senega*): large river in w. Africa, rising in Mt. Cooro, lat. 10° 30′ n., long. 10° 40′ w., flowing first n.w., then w. to the Atlantic; length 1,000 m., for the last 740 of which it is in large portions navigable for flat-bottomed boats. Here and there, throughout its course, the navigation is interrupted by cataracts, shoals, and rocks. In the lower course, the river forms numerous large, cultivated, and very fertile islands. The entrance is difficult on account of breakers and a bar which, in the dry season, is covered by about 9 ft. of water. It is navigable for some months by steamers drawing not more than 8 ft., to Mediné (furthest inland French station), 650 m. from the mouth (see SENEGAMBIA). Thence the French have been making a railway to Bamakon, on the Niger. From Mafu to the sea (215 m.), the river is navigable through the year.

SENEGAMBIA, *sĕn-ė-găm'bĭ-a:* large tract of country—the region watered by the rivers Senegal and Gambia—in w. equatorial Africa, between the Senegal and Sierra Leone. It is bounded by the Atlantic on the w., but has very indefinite eastward limits; estimated about 400,000 sq. m. Between the two great rivers, 250 m. apart, there are no water courses of importance; and from the Gambia s. to the frontier of Sierra Leone, the only considerable stream is the Rio Grande. The coast is deeply indented by arms of the sea, which resemble estuaries of rivers. The country forms the w. and n. declivity of the plateau of Kong, and part of it is still unexplored. The soil is of two kinds—that of the coasts, and that of the interior: the former consisting in part of low, flat, alluvial plains; and partly of an undulating country, which broadens toward the n., until, on the n. frontier, it merges into the Sahara; while the plateau of the interior rises from the coast plains in mountainous terraces, until it loses itself in the Kong Mts. Its elevations are not accurately determined; Mt. Dara (highest measured) is 4,068 ft. S. is divided into three districts—High, Middle, and Low S. High S. comprises the country n. of the Senegal, and is inhabited by Moors, who, of course, profess Islamism. Middle S. comprises the countries bordering the Senegal, 1,350 sq. m., and is inhabited by negroes, in numerous tribes. The climate is extremely hot, and is unhealthful in the marshy districts. The soil is generally fertile, and yields the crops usual in the hot regions of Africa. Low S. comprises the countries bordering the Gambia, and extends s. to Nunez. France possesses on the left bank of the Senegal (inland to Mediné), and along the coast to the Gambia, about 96,000 sq. m.; pop. about 198,000, the cap. of the French colony of Senegal is St. Louis (q.v.). Portugal has a small tract (30 sq. m.) on and around the estuary of the Rio Grande; and the English control a little territory at the mouth of the Gambia (26 sq. m.).

SENESCENCE, n. *sĕ-nĕs'sĕns* [L. *senescens*, growing old; *senesco*, I grow old—from *senex*, old]: the state of growing old; decay by time. SENES'CENT, a. growing old.

SENESCHAL, n. *sĕn'ĕ-shăl* [OF. *seneschal;* mid. L. *seniscal'cus*, the steward—from Goth. *sins*, old (senior?), and *skalks*, servant]: in the *middle ages*, a high steward; officer first in the household of the Frankish kings, who had superintendence of feasts and domestic ceremonies in the houses of princes or high dignitaries. In the course of time the term became one of dignity, applied to military commanders invested also with judicial power; lieutenants of the great feudatories often took the title. A similar officer in England and Scotland was designated steward, rendered in L. *senescallus*. SEN'ESCHALSHIP, n. the office or dignity.

SENGREEN, n. *sĕn'grēn* [Ger. *singrün*, the house-leek]: a plant, the Common House-leek (q.v.); *Sempervīvum tectōrum*, ord. *Crassulāceæ*.

SENILE, a. *sē'nīl* [F. *sénile*—from L. *senīlis*, aged—from *senex*, old: It. *senile*]: pertaining to old age, or proceeding from it; old; aged. SENILITY, n. *sĕ-nĭl'ĭ-tĭ*, old age; dotage.

SENIOR, a. *sēn'yĕr* [L. *senĭor*, older—from *senex*, old]: older; elder; older in office or rank: N. one older than another; one having superiority or precedence from office or rank; an aged person. SE'NIOR'ITY, n. *-ŏr'ĭ-tĭ*, priority of birth or office. SENIOR OPTIME, *ŏp'tĭ-mē* [L. *optĭmĕ*, best]: at *Cambridge Univ.*, a second-class man in mathematical honors, the first-class being called wranglers. SENIOR SOPH, *sŏf* [Gr. *sophos*, wise]: a third year's man in some European universities.

SENIOR, *sēn'yĕr*, NASSAU WILLIAM: political economist: 1790, Sep. 26—1864, June 4; b. Compton, Berks, England; eldest son of the Rev. J. R. Senior, vicar of Durnford, Wilts. He was educated at Eton, and Magdalen College, Oxford, where he graduated 1811, taking a distinguished first-class in classics. In 1819 he was called to the bar at Lincoln's Inn. In 1825 he was elected to the professorship of polit. econ. at Oxford, in which, after its statutory term of five years, he was succeeded by Mr. Whately, afterward Abp. of Dublin. S. again held this professorship 1847–52. In 1832 the enormous evils of the poor-law administration in England led to the appointment of a commission of inquiry, of which S. was a member; and the portion of the Report detailing existing abuses was drawn up by him. This Report encouraged the whig govt. to bring in the Poor-law Amendment Act of 1834: see POOR, THE—POOR LAWS. His publications were very numerous, comprising treatises, lectures, pamphlets, etc., on political economy. He also contributed largely to the *Edinburgh Review* and other leading periodicals. He has left some interesting journals of his visits to Turkey and Greece, and observations on the political and social condition of those countries. His *Essays on Fiction*, contributed to the chief reviews 1821–57, repub. 1864, relate principally to the novels of

Scott, Bulwer-Lytton, and Thackeray. He analyzes the plots and classifies the characters of the Waverley novels with curious felicity, and devotes a masterly essay to Thackeray, whom he regards as the greatest novelist of his day. The intellect of Senior was acute, and he is conceded to have done great service to political economy by correcting current errors in nomenclature, and by insisting on rigor in reasoning, and strictness in definition. Criticisms have been directed against his too formal treatment, his limitation of scope, and his disregard of the higher and moral elements which have force in political economy. Though honoring the moral forces by a distinct acknowledgment, his system fails to reckon with them. His *Conversations with Distinguished Persons during the Second Empire,* an interesting and valuable work, appeared 1878.

SENLAC. See HASTINGS, Battle of.

SENLIS, *sŏng-lēs':* very ancient town of France, department of Oise, 33 m. n.e. of Paris. Its older portion is surrounded by walls, flanked with 16 towers, all that remain out of the 28 towers of early times. The cathedral, a small edifice, is a beautiful specimen of early Gothic. Senlis has many other interesting monuments of antiquity. Manufactures of cloth, lace, and thread are actively carried on. Pop. about 7,000.

SENN, NICHOLAS: American surgeon: b. Buchs, Switzerland, 1844, Oct. 31; d. 1908. He was brought to this country when a boy and settled in Wisconsin. He was educated at the Chicago Medical College and the University of Munich, was house physician at the Cook County Hospital 1868-9 and practiced medicine in Wisconsin 1869-93, being at one time surgeon-general of that state. Since 1893 he practiced in Chicago, where he was attending surgeon of the Presbyterian Hospital, and surgeon-in-chief of the St. Joseph's Hospital. He was appointed in 1898 chief surgeon of the 6th Army Corps, ranking as lieutenant-colonel of volunteers, and chief of staff in the field. From 1884-90 he was professor of surgery at the College of Physicians and Surgeons, Chicago, and since 1890 was professor of practical and clinical surgery at the Rush Medical College. He was also professor of surgery at the Chicago Polyclinic, and lecturer on military surgery at Chicago University. He wrote voluminously, among his works being *Four Months Amongst the Surgeons of Europe; Experimental Surgery* (1889); *Surgical Bacteriology* (1889); *Principles of Surgery; Tuberculosis of Bones and Joints; Medico-Surgical Aspects of the Spanish-American War; Around the World via Siberia;* and a *Nurse's Guide for the Operating Room* (1903).

SENNA, n. *sĕn'nă* [It. *sena*—from Ar. *sana,* senna: F. *séné,* senna]: leaves of several Eastern plants, much used in medicine as a purgative; *Cassĭa lancĕōlāta, C. acutĭfol'ĭa, C. elongāta, C. obtusāta,* and *C. obovāta,* of genus

Cassia (q.v.), sub-order *Cæsalpiniĕæ*, order *Leguminōsæ*. —Senna is an important purgative, of which two sorts are recognized—Alexandrian and Tinnevelly. The Alexandrian leaves are obtained chiefly from *Cassia lanceolata*, while the Tinnevelly senna leaves are yielded by *Cassia elongata*. *Alexandrian S.* is grown chiefly in Nubia and Upper Egypt, and is exported in large bales from Alexandria: it is apt to be adulterated with the flowers, pods, and leaves of *Cynanchum argel* and *Tephrosia apollinea*. *Tinnevelly* or *E. Indian S.*, in odor and taste entirely resembles Alexandrian senna: the leaflets are, however, 'about two inches long, lanceolate, acute, unequally oblique at the base, flexible, entire, green, without any admixture.'

Senna as a purgative holds a middle place between the mild laxatives and drastic cathartics. It increases intestinal mucous secretion, as well as peristaltic motion, producing loose brown evacuations. Its disadvantages are its disagreeable taste, and its tendency to produce nausea, griping, and flatulence; the means of correcting which are noticed below. It should never be employed in an inflammatory state of the intestinal mucous membrane. Whatever its cathartic principle may be, it is thought to be absorbed into the circulation before it begins to operate, since this drug imparts a purgative property to the milk of nurses.

Bladder Senna (*Colutëa*) is a genus of shrubs of nat. order *Leguminosæ*, sub-order *Papilionaceæ*, having pinnated leaves, red or yellow flowers, and remarkably inflated pods, whence the Eng. name. One species (*C. arborescens*), native of s. Europe, is almost the only plant found on the ascent of the crater of Mount Vesuvius.

SENNAAR, *sĕ-nar'*: North Africa, a region extending between the Blue and the White Nile, from Khartum to Fazogl, or in a broader sense a province of the Egyptian Sudan. It covers an area of 40,000 sq. m. Generally speaking, it is a broad plain with occasional granite mountain heights, and at the north steppes thickly overgrown by wild grass and bushes; at the southeast tall forests intersected by fertile valleys. Gold and iron occur, and palms, tamarinds, etc., grow on the plain. Monkeys, lions, gazelles, giraffes, elephants, besides marsh and water-birds, are numerous; also domestic animals. The chief occupation is fishing. The products are rice, grain, melons, tobacco, sugar, senna, ebony and sandal-wood. The climate is exceedingly warm, and during the rainy season unhealthful. The inhabitants are negroes—the Fundj, Nubian, and Galla, and of mixed races, and are sometimes classified according to color. Slaves are imported. Sennaar (pop. 10,000), the former capital, stands on the Bahrel-Azrik or Blue Nile. The other towns are Fazogl (or Famaka), Roséres, Wod-Medineh, and Khartum. Near the latter town are the extensive ruins of Soda, the ancient capital of the Funj.

SENNACHERIB: an Assyrian king, son of Sargon, succeeded his father on the throne 705 B.C. Among his first acts as king was the suppression of the revolt of Babylonia, and after accomplishing this he directed his arms against the Aramean tribes on the Tigris and Euphrates, of whom he took 200,000 captive. He then reduced a portion of Media, till then independent; placed under tribute Tyre, Aradus, and other Phœnician cities; advanced against Philistia, made war upon Egypt, and finally marched against Hezekiah, king of Judah, who had revolted. Hezekiah, terrified, yielded in a panic, and paid the tribute exacted, namely, 300 talents of silver and 30 talents of gold. On his return to Assyria Sennacherib made another attack on Babylonia, and afterward reinvaded Judah. Having marched through Palestine he laid siege to Libnah and Lachish, and finding that his messengers Tartan, Rabsaris, and Rabshakeh had failed in obtaining the submission of Hezekiah, he wrote an intimidating letter to Hezekiah; but before he could bring his forces against the city, according to the Bible record, a visitation from the Lord during the night caused the death of 185,000 of his troops. In consequence of this calamity Sennacherib returned to Nineveh and troubled Judah no more. From Herodotus we learn of the Egyptian tradition regarding the destruction of Sennacherib's host, which is, that a multitude of field mice devoured all the quivers and bow-strings of the enemy, and gnawed the thongs by which they bound on their shields. No mention of the destruction of his host is found in the monuments of Sennacherib. Sennacherib was one of the greatest of the Assyrian kings, and was not only a great warrior but also a great builder. His greatest architectural work was the palace of Koyunjik, which covered an area of fully eight acres. Of the death of Sennacherib all that is known is contained in the brief Scripture statement of 2 Kings xix. 37 and Isa. xxxvii. 38, from which it appears he was murdered by his own sons.

SENNIGHT, or SE'NNIGHT, n. *sĕn'nīt* or *-nĭt* [contracted from *seven-night*]: a week; seven days.

SENNIT, n. *sĕn'nĭt* [from *seven* and *knit*]: a flat plaited cord, formed of rope-yarns; plaited straw or palm-leaves for making hats.

SEÑOR, n. *sān'yōr* [Sp.]: lord; sir; gentleman. SEÑORA n. fem. *sān-yōr'ă,* lady; madam; mistress.

SENS, *sŏng:* old town of France, dept. of Yonne, 70 m. s.e. of Paris; amid pleasing scenery on the right bank of the Yonne. The town proper is surrounded by walls, chiefly of Roman construction, and in the vicinity the remains of ancient roads and of Roman camps abound. Sens was the anc. Agenticum, capital of the Senones, one of the most powerful tribes of Gaul. The spacious and handsome Gothic cathedral is the principal edifice: it was erected 1122-68. An active trade in wines, grain, hemp, wool, and timber is carried on. Pop. 14,962.

SENSATION: in psychology, (1) an elementary mental process, coordinate, in most systems, with affection or simple feeling. Sensation is the product of analysis and abstraction. It never stands isolated and detached in consciousness. The doctrine of sensational (and other) elements implies that consciousness may, under suitable conditions, be analyzed into irreducible processes, which stand grouped or integrated in consciousness, under assignable modes or laws of combination (laws of association). Sensations fall naturally into classes which correspond, as a rule, to the various sense organs of the body; thus visual sensations arise through the functioning of the eye, auditory sensations through the ear, etc. Popular and traditional psychology enumerate five *senses* and five corresponding varieties of sensation: sight, hearing, taste, smell and touch. These five senses represent the chief organic instruments whereby the individual forms acquaintance with physical objects. Hence their importance to popular psychology. Scientific psychology substitutes for the five senses a catalogue of sensation qualities, which includes color and brightness, tone and noise, cold, warmth, tendinous strain, pain, cutaneous, muscular and articular (joint) pressure, gustatory and olfactory qualities, and a number (still undefined) of sensations which arise from the visceral organs. The distinction is commonly drawn between *sensation of special sense* (i.e., sensation set up by a stimulus acting outside, or upon the surface of, the body) and *organic sensation* (sensation set up by an organic change within the body). Color, tone and cutaneous pressure would be instances of the first kind; articular and muscular pressure and tendinous strain instances of the second kind. Various attempts have been made to include all simple feelings under sensation; and, on the other hand, some psychologists maintain that to sensational and affective elements should be added a third class of 'intellectual' elements. No great agreement upon the essential nature of these intellectual elements has, however, been reached. In some psychological systems the distinction has been drawn between 'peripherally initiated' and 'centrally initiated sensations.' The former arise under the immediate action of some sense organ; the latter depend altogether upon cortical (cerebral) functions, and they are therefore independent of the presence of an object or indeed of any bodily process outside the brain. The distinction takes account of the qualitative similarity of 'images' and objects of perception. (See IMAGE and PERCEPTION.) (2) Sensation is a cognitive function. It differs from *perception* both in the amount and the character of the knowledge of objects which it conveys. Sensation mediates 'mere acquaintance with' the qualities and attributes of objects with little or no apprehension of the relations between these qualities and attributes or be-

tween different objects. Perception, on the other hand, mediates 'knowledge about' objects; i.e., objects as 'classed, located, measured, compared, assigned to a function, etc.' (W. James).

SENSATIONALISM: in philosophy, the doctrine that all forms of knowledge originate in sensation. Sensationalism may be traced, as an epistemological theory, at least as far back as the Greek Sophists. It has played a prominent part in the history of philosophy. It seeks to reduce judgment, reason, reflection, and, sometimes, also will and the moral control of conduct to the direct action upon consciousness of objects of perception. Sensationalism (called also, in some connections, *Sensualism*) is, in general, opposed to *rationalism*, which finds in reason an independent and authoritative source of knowledge. Inasmuch as sensationalism lays emphasis upon the development of knowledge out of individual experience, it appears in the history of thought under various forms of *empiricism*. Thomas Hobbes is regarded as the founder of modern sensationalism. He made the sense impression the first factor in cognition, and experience 'the totality of perceptions retained in memory, together with a certain foresight of the future after the analogy of the past' (R. Falckenberg). John Locke, in his refutation of the innate ideas of Descartes, maintained that the beginning of knowledge rests upon sensation; that thought is of itself unable, prior to perceptual experience, to originate ideas. By admitting reflection, however, as a coordinate source of knowledge with sensation, Locke avoided the extreme form of sensationalism that was developed by some of his followers. E. B. Condillac, e.g., sought to complete Locke's refutation of innate ideas by reducing reflection itself and with it all the cognitive and volitional functions of consciousness to sensation. The single original faculty of the soul, Condillac contended, is sensation; from it all other faculties are developed. Thought itself is but refined sensation. This extreme form of sensationalism, which became the philosophy of the French enlightenment, was illustrated by Condillac's famous fiction of the statue which attained to human knowledge through the successive unfoldment of the several organs of sense. Sensationalism was criticised by Immanuel Kant, who rejected the naive view that objects are known to consciousness immediately through the matter of sense. Kant maintained that knowledge involves also certain innate or *à priori forms* of sense as well as the categories of the understanding. In spite of Kant's searching criticism, sensationalism has continued up to the present to appear under various forms. The theory of sensationalism should not be confounded with the psychological doctrine that consciousness is analyzable into sensational (and other) elements. See SENSATION and ASSOCIATION.

SENSE, n. *sĕns* [F. *sens*—from L. *sensus*, perception, feeling—from *sentĭō*, I discern by the senses: It. *senso*, sense]: that power or faculty by which animals obtain a knowledge of physical objects, by these either coming into contact with certain organs of the body, or by making impressions on them (see SENSATION, in Physiology); perception by the senses; discernment; understanding; strength of natural reason; meaning or import; consciousness. THE SENSES, *sĕn'sĕz*. SENSATION, n. *sĕn-sā'shŭn* [F.—L.]: impression on the mind through any one of the senses; state of interest or feeling excited in the mind by external objects, by the passions, by the internal condition of the body, or by the words of a speaker. SENSA'TIONAL, a. *-ăl*, pertaining to sensation; fitted to excite great interest; a term applied to such orators, novelists, or dramatists as seek popularity through the effects on the public mind of startling, exaggerated, or unnatural sentiment or situation. SENSA'TIONALISM, n. *-ĭzm*, quality or practice of producing popular effect by that which is startling or unnatural: in *philos.*, doctrine that our ideas originate solely in sensation, and consist of sensations transformed (see SENSATION, in the Philosophy of Mind). SENSA'TIONALIST, n. *-ĭst*, one who aims to startle by use of the unnatural or the exaggerated: in *philos.*, one who regards the phenomena of mind as having their origin in sensations. SENSELESS, a. *sĕns'lĕs*, incapable of sensation; void of feeling; unconscious; stupid; foolish. SENSE'LESSLY, ad. *-lĭ*. SENSE'LESSNESS, n. *-nĕs*, the state or quality of being senseless; folly; stupidity. SENSIBLE, a. *sĕn'sĭ-bl* [F.—L.]: capable of being perceived by the senses or by the mind; perceiving by the mind or senses; liable to be easily and strongly affected; moved or affected by a very small weight, impulse, or change; perceiving so clearly as to be convinced; aware; intelligent; judicious. SEN'SIBLY, ad. *-blĭ*, externally; by impression on the senses; intelligently; judiciously. SEN'SIBLENESS, n. *-bl-nĕs*, or SEN'SIBIL'ITY, n. *-bĭl'ĭ-tĭ* [F. *sensibilité*—from L.]: capacity or readiness of perception or emotion; delicacy of feeling; state of being easily affected or moved (see below). SEN'SITIVE, a. *-tĭv*, quickly and acutely alive to impressions from external objects; having keen sense or feeling; easily affected or moved; that affects the senses. SEN'SITIVELY, ad. *-lĭ*. SEN'SITIVENESS, n. *-nĕs*, the state or quality of being sensitive; acute sensibility. COMMON-SENSE, the faculty of first principles; native practical intelligence: see COMMON. MORAL SENSE: see MORAL. THE INNER OR INTERNAL SENSE, the capacity of the mind to be aware of its own states; consciousness. IN HIS SENSES, possessed of reason and judgment; sane. OUT OF HIS SENSES, destitute of the usual powers of reasoning and judging; insane.—SYN. of 'sense': sensation; faculty; power; perception; apprehension; sensibility; understanding; reason; opinion; notion; judgment; consciousness; conviction; meaning; import;—of 'sensation': perception;

sensibility; susceptibility; emotion; passion; consciousness; reflection;—of 'senseless': unfeeling; unsympathizing; unreasonable; stupid; doltish; blockish; unconscious.

SENSES: special faculties of sensation by means of which the mind obtains knowledge of external objects and phenomena. The senses, five in number, are touch, taste, smell, sight, and hearing. The four last named are operative because of special organs connected by special nerves with the brain. As to touch, while there are special organs, it is an unsettled question whether tactile sensations are conveyed by special nerves or by the ordinary sensory nerves of the skin. The organs of sense are in reality working tools of the brain, and depend upon the alertness of the brain for efficiency. It is in fact the brain that sees, hears, etc. As sight, hearing, and touch seem to be most concerned with the wants of the intellect, they are sometimes spoken of as the intellectual senses; while taste and smell, being intimately connected with nutrition, are known as the corporeal senses.

Cultivation of the senses, especially if begun in early life, will develop their usefulness. It produces the accurate hearing of the musician, the keen eyesight of the pilot engineer, and expert microscopist, and the accurate touch of the blind. But training may be carried to such an extent as to make these senses sources of misery. Certain persons are painfully conscious of the slightest discord; others almost instantaneously detect, with a feeling of disgust, the inharmonious blending of tints which, to the average person, are all in harmony; still others are made uncomfortable by an odor perceptible to none but themselves. All the senses become accustomed to continued impressions, so that they no longer perceive their existence. This condition may prove a source of danger, for one may, for example, become habituated to harmful odors. Sense-education of the feeble-minded, as accomplished by Seguin and his wife, by 'constant, assiduous, philosophical training,' is a noteworthy achievement. It seems to be a rule, with but few exceptions, that when one sense is lost or seriously impaired nature sharpens some other.

Touch, or tactile sensibility, enables us to appreciate by actual contact, the size, form and consistency of objects and the character of their surface. It is most sensitive in the margin of the lips, tip of the tongue, palms of the hands, and under surfaces of the fingers. Some writers speak of 'general sensibility' as one of the senses, and include under this term, touch, muscular sense or the sense of pressure, sense of temperature, etc. The organs of touch are end-bulbs and tactile corpuscles.

Taste enables us to discover and recognize flavors. This sense resides in the tongue, soft palate, uvula, pillars of the fauces, tonsils, and the upper part of the pharynx. The organs of taste are taste-buds and various

papillæ. The nerves of taste are the gustatory branch of the fifth pair of cranial nerves and the lingual branch of the glosso-pharyngeal nerve. Only those substances can be tasted which are dissolved, and at the same time the mucous membrane of the mouth must be moist.

Smell is the sense by which odors are perceived. The olfactory nerve is, like the optic nerve, a prolongation of the cerebrum. The olfactory bulb is at the anterior extremity of the olfactory nerve (more strictly the olfactory tract), of which it is an enlargement, and the de velopoment of the bulb bears direct relation to the acuteness of smell. In some animals, in which smell is very acute, the bulb is of such size that it is called the olfactory lobe. In man the impresions of this sense often need to be confirmed through other senses. Odors, to be recognized, must be presented in a gaseous or vaporous form. Dryness of the mucous membrane of the nose and excessive secretion blunt the sense of smell. Some persons are so susceptible to odors and emanations that the smell of certain substances, as of roses, new-mown hay, etc., or of certain powdered drugs, may excite in them an inflammation of the nasal passages. Hay fever is one form of such inflammation. There is an intimate relation between smell and taste. Delicate flavors are not appreciated when the nose is obstructed as by catarrh, etc., or in cases of anosmia, loss of the sense of smell. Smell influences the respiratory process, and the breathing of a fine odor increases the amplitude of the respiratory movements. The sense of smell may be highly developed, especially where there is deficiency in other senses. By it certain blind and deaf persons are able to recognize any one with whom they have previously come in contact. This delicate sense is impaired by oversecretion of the nasal mucous membrane (catarrh), by its dryness or its frequent irritation, and may be destroyed by disease or injury.

Sight is the faculty whereby we receive impression of light, movement, form, size, shades of color, and the manifold beauties of nature and art. The organ of sight is the eye, the nerve of sight, the optic nerve. Necessary also to proper vision are the eyebrow, eyelid, eyelashes, lachrymal and Meibomian glands, tear-passages, and certain muscles. Clear vision depends on the focusing of rays of light through clear media upon the retina, and the conveyance of impressions so brought to the cerebrum by means of the optic nerve. Defects in vision are color-blindness, myopia, presbyopia, hypermetropia, astigmatism, etc.

Hearing is a sense whose organ is divided into three parts, external, middle, and internal. The latter is essential, the others are accessory. Hearing is effected by means of impressions made by the vibrations of elastic bodies (ordinarily the atmosphere). Impressions of sound-waves are conveyed through the complex apparatus

of hearing to the auditory nerves, and through them to the brain. Any interference with the delicate mechanism of the auditory apparatus, as by inflammation or injuries, blunts the sense of hearing.

SENSITIVE FLAMES: gas flames which are easily affected by sounds. The most sensitive flame is produced in burning gas issuing from a small taper jet. Such a flame will be affected by very small noises, as the ticking of a watch held near it, or the chinking of small coins 100 feet away. The gas must be turned on so that the flame is just at the point of roaring. Professors Barrett and Tyndall have performed many highly interesting experiments with these flames.

SENSISM, n. *sĕns'ĭsm:* the same as SENSATIONALISM.

SENSITIVE PLANT, or HUMBLE PLANT: an herb (*Mimosa pudica*) of the order *Leguminosæ*, a native of Brazil, where it is probably a perennial. It is an erect spiny or hairy plant with long-petioled pinnate leaves and numerous purplish flowers in roundish heads, followed by spiny, jointed pods. It is naturalized in many warm countries, and is cultivated as a curiosity in greenhouses and as a summer annual in gardens. The seeds are sown in early spring in any good garden soil and given ordinary care. The plants are chiefly interesting because of the movements of the leaves when touched. If only lightly touched the leaflets close in pairs, but if more roughly the petioles become depressed. Young foliage responds more quickly, the movement usually occurring within one second after contact. In a few minutes the leaves gradually resume their former expanded position, the time required depending upon the age of the foliage, the warmth of the atmosphere, etc. At night the plants go to sleep, that is, the leaves become depressed as after contact. Other species of Mimosa, especially *M. sensitiva*, a semi-climber, are also somewhat sensitive to touch.

SENSITIZER, n. *sĕns'ĭ-tīz-ėr:* in *photog.*, any substance added to a photographic material to increase or alter its sensitiveness to light. SENSITOM'ETER, n. *-tŏm'ĕ-tėr*, in *photog.*, apparatus for testing the sensitiveness of photographic preparations.

SENSORY AREA: a portion of the brain in which the terminals of the sensory nerve-filaments finally end, constituting the cerebral centers of sensation. The location of the general sensory area is by no means definitely known. There are a number of sensory areas: thus the area for the sensations of sound is located in the superior temporal convolutions of the brain, and destruction of this area prevents the patient not from hearing save when both auditory centers are destroyed, but from the intellectual appreciation of what is heard. The sensory area for sight is located in the occipital region; for smell in the brain-base. The general feeling sense-area, how-

ever, the so-called sensory center in the brain, is thought to lie below the motor area, somewhat overlapping it. It will probably be many years before the exact limits of the various areas in which the different sensory axones terminate are known. When that time does come, however, the student of the diseases of the mind will be in a much better position to understand the different variations in personality as shown in diseases of certain areas. Consult: Flechsig, *Gehirn und Seele;* Barker, *The Nervous System.*

SENSUAL, a. *sĕn'shû-ăl* [F. *sensuel,* sensual—from mid L. *sensuālĭs,* endowed with feeling—from L. *sensus,* perfection, feeling; *sentĭō,* I feel]: pertaining to or affecting the senses only; not intellectual; carnal; not spiritual; given to the indulgence of the appetites; devoted to the pleasures of sense; luxurious; lewd; voluptuous. SEN'SUALIZE, v. *-īz,* to make sensual; to debase by the indulgence of the appetites. SEN'SUALIZING, imp. SEN'SUALIZED, pp. *-īzd.* SEN'SUALIZATION, n. *-ĭ-zā'shŭn,* the act of sensualizing, or the state of being sensualized. SEN'SUALISM, n. *-ĭzm,* a state of subjection to sensual feelings or appetites; in *mental philos.,* the theory held by many that all our ideas, our mental acts, and our intellectual powers, are but mere modifications of former sensations, or originated in them, more accurately designated sensationalism; opposed to *intellectualism.* SEN'SUALIST, n. *-ĭst,* one addicted to sensual pleasures; a voluptuary; one who holds the theory of sensualism. SEN'SUALLY, ad. *-lĭ.* SEN'SUALNESS, n. *-nĕs,* or SEN'SUAL'ITY, n. *-ăl'ĭ-tĭ* [F. *sensualité*—from mid L. *sensualĭtātem*]: the state or quality of being sensual; devoted to the gratification of the bodily appetites. SEN'SUOUS, a. *-ŭs,* pertaining to or addressed to the senses; connected with sensible objects; full of passion; pathetic.—SYN. of 'sensualist': epicure; gourmand; voluptuary.

SENT: pp. of SEND, which see.

SENTENCE, n. *sĕn'tĕns* [F. *sentence*—from L. *senten'tĭa,* an opinion, a decision, a sentence—from *sentĭō,* I perceive or feel: It. *sentenzia*]: the judgment pronounced on a criminal by a judge; decree or judgment of a court; a maxim; an opinion; a decision, usually unfavorable; series of words so arranged as to convey complete sense, and followed by a dot or full point, thus (.) (see below): in *OE.,* sense; meaning: V. to pass judgment on, as a court; to doom; to condemn. SEN'TENCING, imp. SEN'TENCED, pp. *-tĕnst.* SENTENTIAL, a. *sĕn-tĕn'shăl,* pertaining to a sentence or period; comprising sentences. SENTEN'TIALLY, ad. *-shăl-lĭ.* SENTEN'TIOUS, a. *-shŭs* [L. *sententĭōsus,* full of meaning]: abounding in axioms or maxims; short and pithy in expression; terse; comprising sentences. SENTEN'TIOUSLY, ad. *-lĭ.* SENTEN'TIOUSNESS, n. *-nĕs,* brevity and pithiness in expression. A DARK SENTENCE, a saying not easily understood.—SYN. of 'sen-

tence, n.': phrase; expression; proposition; period; paragraph; opinion; dogma; condemnation; doom.

SEN'TENCE: the form of words in which a thought or a Proposition (q.v.) is expressed. A mere phrase or group of words, e.g., 'A very high mountain,' which only conveys a meaning or calls up an idea, but does not make an affirmation, is not a sentence. Since speech is the expression of thought, the sentence is the proper unit or integer of speech, and thus forms the starting-point in the study of language.

Every sentence is made up of two parts—one naming the subject or the something that is spoken about; the other the predicate or the something that is said of it—as, 'The sun—shines;' 'Those who have the greatest gifts, and are of the greatest usefulness—are the most humble.' Every sentence must contain a finite verb, as it is the function of the Verb (q.v.) to make affirmations. 'The sun shines,' is an example of a sentence in its barest form, containing merely the subject 'sun' and the predicate 'shines,' which are called the *principal* elements. The enlargement or development of the sentence takes place by means of adjuncts, or *secondary* elements, tacked on to the principal elements—as, '*Young* birds build *nests without experience*.'—Sentences may be classed as simple, compound, and complex.

1. A simple sentence has only one subject and one finite verb. Reduced to its essentials, it is of the form, 'The sun shines;' 'The day is cold.' 2. A compound sentence consists of two or more simple sentences combined—e.g., 'The sun gives light by day, and the moon by night;' which contains two affirmations or sentences. 'The sun gives light by day,' and 'The moon gives light by night.' 3. A complex sentence consists of one principal sentence with one or more dependent sentences. In the compound sentence given above, there are two distinct statements; and as both are put on the same footing, they are said to be *co-ordinate* sentences. But when we say, 'The moon rose as the sun went down,' the going down of the sun is not mentioned on its own account; the only thing directly affirmed is that the moon rose at a certain time, and the going down of the sun is introduced only as marking that time. Such clauses are called *subordinate* sentences (see CONJUNCTIONS). The subordinate clauses of complex sentences may be considered as transformations of the elements of the simple sentence; and according to the nature of the element which has been transformed, they might be called noun-sentences, adjective-sentences, or adverbial sentences—e.g., '*The existence of God* is a ground of comfort'='*That God exists* is a ground of comfort.' '*Benevolent* men are happy'='Men *who seek the good of others* are happy.' 'The moon rose *at sunset*'='The moon rose as *the sun went down*.' Further, the nouns, adjectives, and adverbs that enter into a subordinate sentence may, one and all, be transformed

in their turn into sentences, which will thus be subordinate in a still higher degree—e.g., 'Europe rejoiced *that Greece was delivered from that oppressive power*'= 'Europe rejoiced *that Greece was delivered from the power that had oppressed her.*' Here the adjective *oppressive* in the first sentence has in the second been converted into a sentence; directly dependent, not on the principal sentence (Europe rejoiced), but on the subordinate; and is therefore subordinate in the second degree. Subordination is seldom carried beyond the second or third degree, as it becomes perplexing, and weakens the force of the principal assertion. The same sentence is often compound, as containing two or more co-ordinate sentences; and at the same time complex, as containing one or more subordinate sentences in addition; and to discriminate all these, and point out their relations, is to give the syntactical analysis of the sentence.

SENTER, *sĕn'tėr*, ISAAC, M.D.: 1755-99, Dec. 20; b. N. H. After studying medicine, he became a surgeon in the revolutionary army, was with the expedition to Quebec under Arnold, practiced medicine at Pawtucket, R. I., but afterward removed to Newport, where he became famous as a physician and surgeon. He wrote for medical journals and was an honorary member of various medical societies, including those of London and Edinburgh.

SENTERY, n. *sĕn'tėr-ĭ*, and SEN'TERIES, plu. *-tėr-ĭz: OE.* for SENTRY and SENTRIES.

SENTIENT, a. *sĕn'shĭ-ĕnt* [L. *sentiens* or *sentĭen'tem*, discerning or perceiving by the senses—from *sentīrĕ*, to feel]: that perveives or feels; having the faculty of perception: N. one who has perception. SEN'TIENTLY, ad. *-lĭ.*

SENTIMENT, n. *sĕn'tĭ-mĕnt* [F. *sentiment*, understanding, sentiment—from L. *sentĭō*, I perceive or feel: It. *sentimento*]: opinion; the decision of the mind expressed in words; thought, or direction of thought; a sentence or passage, as the expression of a thought; a particular disposition of mind; an opinion expressed in striking words; tender susceptibility; feeling; sensibility; emotion. SEN'TIMENT'AL, a. *-ăl*, abounding with or exciting sensibility; appealing to sentiment, rather than reason; artificially or affectedly tender; indulging in displays of exaggerated feeling; romantic. SEN'TIMENT'ALLY, ad. *-lĭ.* SEN'TIMENTAL'ITY, n. *-ăl'ĭ-tĭ*, affectation of sentiment or fine feeling. SEN'TIMENT'ALIZE, v. *-ăl-īz*, to affect refined thought and express it in suitable language. SEN'TIMENT'ALIZING, imp. SEN'TIMENT'ALIZED, pp. *-īzd.* SEN'TIMENT'ALISM, n. *-ăl-ĭzm*, the character or behavior of a sentimentalist. SEN'TIMENT'ALIST, n. *-ăl-ĭst*, one who affects fine feeling or exquisite sensibility.—SYN. of 'sentiment': opinion; notion; thought; feeling; disposition; judgment; maxim; saying; toast; sensibility.

SENTINEL, n. *sĕn'tĭ-nĕl* [F. *sentinelle;* It. *sentinella,*

a sentinel]: OF. *sente*—from L. *sēmĭta,* a path: also derived by some from L. *sentĭō,* I perceive]: one who watches or keeps guard; a sentry: V. to watch over; to furnish with a guard. SEN'TINELLED, a. *-nĕld,* furnished with sentinels.—*Sentinel* or sentry is a private soldier, marine, or sailor, posted at a point of trust, with the duty of watching the approach of an enemy, or of any person suspected. Sentries mount guard over depots of arms, the tents of commanding officers, etc. During the night, each sentry is intrusted with the 'word,' or countersign; and no person, however exalted in position, may attempt to approach or pass him without giving that word as a signal. In such case, the sentry is bound to arrest the intruder, and, if necessary, to shoot him. It has happened that the commander-in-chief of an army—not remembering the word, or refusing to give it—has been prisoner in the hands of one of his own sentries. When an army is in the field, the sentries are its eyes, for they guard the approaches in every direction, some distance in front of the main body of troops. In the event of attack, they give the alarm, and retire slowly to their supports. There is usually an agreement, tacit or expressed, between hostile commanders that their outlying sentries shall not fire on one another, which would only produce useless bloodshed. Under martial law, death is the penalty to a sentry for sleeping on guard.

SENTINEL CRAB (*Podophthalmus vigil*): a genus of Crabs or Decapodous Crustaceans, so named from its active watchful habits, and from the very elongated footstalks upon which the eyes are set. This species, the only one of its genus, inhabits the shores of the Indian Ocean, and occurs in the Mauritius and Philippine Islands. Its average length is from 2 to 4 inches. Each eye-stalk consists of a long primary or first joint and of a short second joint. When the animal is at rest the eye-stalks are laid horizontally on the front margin of the carapace or body, and lie in two special grooves or channels. This crab is included in the family Portunidæ, is further distinguished by its flat wide carapace, and by the elongated *chelæ* or nipping-claws.

SENUSSI: a Moslem confraternity of austere and fanatical doctrines, which has done much to unite the Mohammedan population of North Africa in hostility and resistance to foreign and infidel influences. Mohammed es-Senussi ('of the Senus mountains'), from Mostaganem in Algeria, became famous about 1830 in Fez for his sanctity. After performing the Haj to Mecca he founded a convent at Alexandria, but was excommunicated by the Sheikh ul-Islam and settled in the Libyan desert, first near Bengazi in Barca, and then at Jerabub or Jaghbub near the oasis of Siwa. Here he established a prosperous college, and here in 1860 he died, being succeeded by his son, who claimed to be the promised Mahdi, though his manifestation was to be postponed till

1892. The confraternity has ramifications all over North Africa, especially in Tripoli, Fezzan, and Gadames. The French have come into contact with them; their agents have repeatedly stopped European travellers; and after the death in 1885 of the Egyptian Mahdi, from whom they carefully held aloof, they acquired additional influence in the Soudan. See Wingate, *Mahdiism and the Egyptian Sudan* (1891).

SENTRY, n. *sĕn'trĭ* [F. *sentier;* OF. *sente,* a path, the sentry being confined to a short path or beat (see also SENTINEL]: soldier placed on guard to give notice of the approach of danger; guard; watch; the duty of one on guard. SENTRY-BOX, a stout portable shed for the occasional shelter of a soldier on guard.

SENZA SORDINO, *sen'tsâ sawr-dē'nō* [It., without the mute, or without the damper]: musical term, which, when applied to the violin or violoncello, denotes that the Mute (q.v.) is to be removed. In pianoforte music, it means that the performer must press down the pedal which takes off the dampers.

SEONI: the capital of a district in the central provinces of India, half-way between Nagpur and Jabalpur on the great Deccan road. Pop. 10,203.—There is another smaller Seoni (Pop. 7,100) 35 miles s.w. of Hoshangabad.

SEOUL, SÖUL, or locally HAN-YANG, Korea: the capital of the country, on the river Han, about 70 miles by water from its mouth in the Yellow Sea, and 25 miles by rail from Chemulpo, its seaport. The city proper is a short distance from the river, in a basin partly surrounded by heights, and enclosed by a wall. The streets are narrow and dirty, and the native houses low and mean. The royal palace is the chief edifice, and with its grounds occupies over 500 acres enclosed by a lofty wall. Seoul is the seat of various foreign embassies; a Roman Catholic cathedral is the principal European building. Silk, paper, tobacco, mats, fans, and similar commodities are the principal products of native industry. There are schools for the teaching of Japanese, French, Chinese, Korean, Russian, and English, and an American Mission School, which is subsidized. Seoul is connected with all the open ports of Korea by telegraph. Pop. (native census of 1902) 196,460; with the suburbs 300,000.

SEPAL, n. *sē'păl* [a term invented, by changing the *pet* of Gr. *petalon,* a leaf, into *sep*—thus, *sepalon:* F. *sépale*]: in *bot.,* one of the leaf-like divisions of the cup or Calyx (q.v.), which incloses the corolla or blossom of a flower. SE'PALLED, a. *-păld,* having sepals. SEPALOID, a. *sĕp'ăl-oyd* [Gr. *eidos,* appearance]: like or having the appearance of a sepal. SEPALODY, n. *sĕp-ăl'ō-dĭ,* the conversion of petals, or other parts of the flower, into sepals. SEP'ALOUS, a. *-ŭs,* resembling a sepal.

SEPARABLE. See under SEPARATE.

SEPARATE, v. *sĕp'ă-rāt* [L. *separātus*, disjoined, separated; *separārĕ*, to separate—from *se*, aside; *parare*, to arrange: It. *separare:* F. *séparer*]: to part or disunite; to break or divide into parts; to sever from the rest; to withdraw, as persons from a meeting, etc.; to withdraw from each other; to make a space between; to set apart for a particular purpose; to open: ADJ. divided from the rest; alone; disunited; detached; distinct. SEP'ARATING, imp. SEP'ARATED, pp. SEP'ARATOR, n. *-rā-tĕr*, one who or that which separates. SEP'ARATELY, ad. *-lĭ*, apart; singly; not in union; distinctly. SEP'ARATENESS, n. *-nĕs*, the state of being separate. SEP'ARA'TION, n. *-rā'shŭn* [F.—L.]: act of separating; disjunction; disconnection: legal disunion of married persons (see below). SEP'ARATIVE, a. *-rā-tĭv*, causing or promoting separation. SEP'ARABLE, a., *-ă-bl* [F.—L.]: that may be disjoined; divisible. SEP'ARABLY, ad. *-blĭ*. SEP'ARABLENESS, n. *-bl-nĕs*, the quality of being separable or capable of separation. SEP'ARABIL'ITY, n. *-bĭl'ĭ-tĭ*, the quality of admitting disunion. SEP'ARATIST, n. *-tĭst*, one who withdraws himself from communion with an established church, or from a church to which he has belonged; a dissenter (see DISSENTERS: QUAKERS: also OATH: and for the application of the term in the early part of the 17th c. in England, see PILGRIM FATHERS). SEP'ARATISM, n. *-tĭzm*, separation from a religious body; dissent. SEP'ARATORY, n. *-tĕr-ĭ*, in *chem.*, a vessel for separating liquids; a surgical instrument: ADJ. used in separation; separative.—SYN. of 'separate, v.': to detach; disconnect; disjoin; divide; part; sever; sunder; disunite.

SEPARATE ESTATE: property belonging exclusively to one of several persons who with respect to other property are joint-owners—e.g., the S. E. of a partner—property belonging to him as an individual: in particular, S. E. of a married woman is the property belonging to her exempt from control by the husband. The tendency of legislation throughout the United States has been toward entirely doing away the husband's common-law marital right of control of the wife's property, and giving to the wife the same right of control of her property as if she were unmarried.

SEPARATE LUTH'ERANS: pietist sect, with various doctrines and branches, which originated at Würtemberg. Opposed for their extreme views, they became separated from the Lutheran body. The name separatist, besides its use in other countries, has been applied to a small society in Bremen, followers of a Lutheran student of theology, Theodore Schermer, who in 1699 advocated the doctrine of an intermediate state of punishment, rejected infant baptism, and discountenanced public worship and the Lord's Supper as liable to abuse. They led a quiet and devout life.—The Separate Lutherans proper do not differ in essential points of faith and practice from Lutherans in general, but only in the pietism, or some excrescence, that has led to their distinct organization. A portion emigrated to America in 1803, and soon were organized by George Rapp, a seceder from the Lutherans at Würtem.

berg; they hold and practice a community of goods, and still exist as a sect in Pennsylvania, occupying the town of Economy in Beaver county, 17 m. below Pittsburgh, on the Ohio. They assumed the name Harmony Society. They are reported, 1891, to have decreased from hundreds, originally, to about 40 persons, and the communal wealth, invested largely in stocks and bonds, is said to be nearly $40,000,000. Those who, early in the 19th c., remained in Germany became known as Kornthalites, from the place, Kornthaler, near Stuttgart, where a community was founded 1819 by G. W. Hoffman. They were extreme millenarians, and purposed to emigrate to Palestine, there to set up anew, in original purity, the kingdom of Christ. A part remained in their native valley as a kind of Moravian community; and a portion, under leadership of Hoffman the younger, at Kirchenhardthof, revived in 1854 the purpose to emigrate to the Holy Land. They are known as Hoffmanites, or Jerusalem Friends, also as the German Temple; they numbered about 3,000, and have founded two colonies, one at Jaffa, in Syria, under Hoffman, who took the title of bishop.

SEPARA'TION of Married Persons: legal disunion of husband and wife—either judicial or voluntary. If the parties enter into a deed, or other arrangement, to live separate, this is called voluntary S.; and, in general, the legal rights of the parties are not altered, except that if the wife is provided with maintenance, she has no longer an implied authority to bind the husband. And though voluntary S. is not encouraged by courts of law, yet effect will be given frequently to deliberate contracts of this kind entered into between the parties. See JUDICIAL SEPARATION.

SEPAWN, n. *sĕ-pawn'*, or SEPON, n. *sĕ-pŏn':* porridge made from maize meal, used as food in N. America.

SEPIA, n. *sē'pĭ-a*, SEP'IÆ, n. plu. *-ĭ-ē* [L. and Gr. *sēpia*, the cuttle-fish: It. *seppia*]: the Cuttle-fish (q.v.): in the *fine arts*, a fine brown coloring matter, prepared from the black secretion or ink of the cuttle-fish (see below). SEP'IC, a. *-ĭk*, pertaining to sepia; done in sepia, as a drawing. SEPIADÆ, n. plu. *sĕ-pī'ă-dē*, a family of Cuttle-fish (q.v.). SEPIOLITE, n. *sĕp'ĭ-ō-līt* [Gr. *lithos*, a stone]: a mineralogical name for meerschaum. SEPIUM, n. *sē'pĭ-ŭm*, internal bone of a cuttle-fish.

SEPIA, *sē'pĭ-a:* pigment used as a water-color. It is prepared from the secretion of a peculiar organ, called the ink-bag, found in the dibranchiate *Cephalopoda*, or Cuttle-fishes. This secretion is black at first, and insoluble in water, but extremely diffusible through it; it is therefore agitated in water to wash it, and then allowed slowly to subside, after which the water is poured off, and the sediment, when dry enough, is formed into cakes or sticks. In this state it is called 'India Ink.' If, however, it is dissolved in a solution of caustic potash, it becomes brown, and is then boiled and filtered, after which the alkali is neutralized with an acid, and the brown pigment is precipitated

and dried: this constitutes the proper sepia. It is usually prepared in Italy, great numbers of the species which yields it most abundantly, *Sepia officinalis*, being found in the Mediterranean. The black kind, called India Ink, is prepared in China, Japan, and India, and forms the common writing-ink of those countries.

SEPIMENT, n. *sĕp'ĭ-mĕnt* [L. *sepimen'tum*, a hedge—from *sepĭō*, I hedge in; *sepes*, a hedge]. a hedge; a fence; a partition.

SEPIOSTARE, n. *sĕp'ĭ-ŏ-stär'*, or SEPIOSTARIUM, n. *sĕp'ĭ-ŏ-stā'rĭ-ŭm* [Gr. *sēpĭa*, the cuttle-fish; *ŏstĕon*, a bone]: internal shell of the sepia, usually called the cuttle-bone.

SEPOMETER, n. *sē-pŏm'ĕ-tĕr* [Gr. *sēpō*, I putrefy; *metron*, a measure]: instrument for determining, by means of the decoloration and decomposition produced in permanganate of soda, the amount of organic impurity existing in the atmosphere.

SEPON: see SEPAWN.

SEPOY, n. *sē'poy* [corrupted from Pers. *sipáhí*, a soldier; *sipáh*, an army—from *sip*, bow and arrow]: native of India, employed as a soldier by the Brit. govt. for service in their Indian empire (see EAST INDIA ARMY). The present S. force is stated at about 140,000.

SEPS, n. *sĕps* [Gr. *sēps*, a venomous serpent whose bite causes putrefaction—from Gr. *sēpō*, I make rotten]: a genus of snake-like lizards having four very short legs, found in the E. Ind. and in the s. and n. of Africa: see SKINK.

SEPT, n. *sĕpt* [a corruption of SECT, which see]: a clan, a branch of a race, or a family—chiefly used of the Irish clans.

SEPT, n. *sĕpt* [L. *septum*, an inclosure]: in *arch.*, a railing.

SEPT, *sĕpt* [L. *septem*, seven]: prefix, signifying seven.

SEPTA: see SEPTUM.

SEPTANGULAR, a. *sĕpt-ăng'gū-lĕr* [L. *septem*, seven; *angŭlus*, a corner]: having seven angles.

SEPTARIUM, n. *sĕp-tā'rĭ-ŭm*, SEPTA'RIA, n. plu. *-rĭ-ă* [L. *septum*, a fence or division; *sepĭō*, I hedge—from *sepes*, a hedge]: ovate flattened nodules of argillaceous limestone, internally divided into numerous angular fragments by reticulating fissures radiating from the centre to the circumference, which are filled with some mineral substance, e.g., carbonate of lime or sulphate of barytes, that has been infiltrated subsequent to their formation. The fissures have been produced by the cracking of the nodule when drying. They are largest and most numerous in the centre, and gradually decrease outward, showing that the external crust had first become indurated, and so, preventing any alteration in the size of the whole mass, produced wider rents as the interior contracted. The radiating figure, and the striking contrast between the dark body of argillaceous limestone and the more or less transparent sparry veins, when the nodule is cut and polished, have caused them to

be manufactured into small tables and similar objects; but they are used most in manufacture of Roman cement, which hardens under water, and which is named from a famous hydraulic cement made of ferruginous volcanic ash brought from Rome. Septaria occur in layers in clay deposits, and are quarried there. They are also dredged up off some coasts, from whose cliffs they have been washed out by the waves. The nodules generally contain a scale, shell, plant, fruit, coprolite, or other organic substance, forming the nucleus that has apparently excited the metamorphic action which withdrew from the surrounding clay the calcareous and ferruginous materials scattered through it, and aggregated them around itself. From the general shape of many septaria, and the wearing away of the outer shell, revealing the turtle-like markings of the fissures, septaria are sometimes mistaken for fossil turtles.

SEPTATE, a. *sĕp'tāt* [L. *septum*, a fence or division]: in *bot.*, separated or divided by partitions.

SEPTEMBER, n. *sĕp-tĕm'bĕr* [L. *September*, pertaining to the seventh month of the old Roman year—from *septem*, seven: F. *Septembre*]: ninth month of the year, formerly the seventh when the year began with March. It has always contained 30 days. SEPTEM'BRIST, n. *-brĭst*, in *F. hist.* (see SEPTEMBRISTS); thence a bloodthirsty person.

SEPTEMBRISTS, *sĕp-tĕm'brĭsts*, or SEPTEMBRISERS, *sĕp-tĕm-brī'zĕrz* (Fr. *Septembriseurs*): frantic executioners in the 'September massacres' in Paris, 1792, Sep. 2, 3. The particular causes of this ferocious outburst were twofold—panic fear of domestic traitors and of foreign despots. The news came pouring into Paris, ever more and more maddening, of Prussian and Austrian hordes marching victorious over the frontiers; insolent royalists obtruding themselves in the van of the invading armies, and breathing threatenings and slaughter; while numerous *aristocrates* (i.e., favorers of the king and court) were believed to be making preparations to receive them in Paris. At the same moment broke out the royalist insurrection in *La Vendée*, rendering France still further delirious; whereupon Danton, 'minister of justice,' procured the passing of a decree 1792, Aug. 28, ordering domiciliary visits for arrest of all suspected persons, and for seizure of arms of which patriotic France stood much in need. More than 2,000 stand of arms were got in this way, and 400 new prisoners. On the morning of Sep 2 arrived the news of the capture of Verdun by the Prussians. The mingled rage and fear of the people cannot be described. All the bells in Paris were set clanging; men and women hurried in myriads to the *Champ de Mars* to be enrolled as volunteers. Danton entered the legislature—'the black brows clouded, the colossus-figure tramping heavy, grim energy looking from all features of the rugged man'—and made that famous speech ending: 'Pour les vaincre, pour les atterrer, que faut-il? De l'audace, encore de l'audace, et toujours de l'audace.' The effect was electrical. He obtained from the assembly a decree condemning to

death all 'who refused to march to the frontiers or to take up arms.' But patriotism against foreigners was not enough. Were not the traitors at home deserving of death? Marat thought so: multitudes of frantic men and women shared his conviction; but it is not proved that either Marat or Danton formally ordered the massacres, or, indeed, that anybody ordered them. They were rather the spontaneous outburst of patriotic insanity, imagining aristocratic treachery and plots everywhere. Priests, Swiss soldiers, aged and infirm paupers, women both reputable and disreputable, and criminals, were mercilessly cut down or shot. From Sunday afternoon till Thursday evening the wild butchery went on at the Bicêtre, the Abbaye, the Convent of the Carmelites, the Conciergerie du Palais, the Grand Châtelet, St. Firmin, La Force, and the Salpétrière. One gathers a glimpse of the savage sincerity of the Septembriseurs when one reads that the gold rings, watches, money, etc., found on the persons of the massacred were all religiously brought to the town-hall; not a single thing was stolen or furtively appropriated until after the essential massacre was done. Then the scoundrels ('sons of darkness,' as Carlyle calls them) sallied out into the streets, and began to plunder, but were speedily suppressed and forced back into their dens.

Great misapprehension prevails as to the numbers who perished in these fearful scenes. Royalist pamphleteers and others, trusting mainly to fantasy (according to Carlyle, *Fr. Rev.*, II. 158), reckon the victims at 3,000, 6,000, even 12,000; but the accurate advocate Maton (who was in the thick of the horrors, and narrowly escaped the guillotine) reduces the number, by 'arithmetical ciphers and lists,' to 1,089, which, be it observed, included numbers of forgers of assignats, and other criminals. It was a sad and horrible affair, as all massacres are; but it is desirable not to exaggerate its *dimensions*, and it is best to trace as correctly as possible the motives of the actors in so execrable a tragedy.

SEPTEMFID, a. *sĕp'tĕm-fĭd* [L. *septem*, seven; *fidi*, I cleft—from *findo*, I cleave]: in *bot.*, applied to a leaf having seven divisions, extending about half-way through it.

SEPTEMPARTITE, a. *sĕp'tĕm-pär'tīt* [L. *septem*, seven; *partītus*, divided—from *pars* or *partem*, a part]: in *bot.*, having seven divisions in a leaf with radiating venation, which may extend to near the base.

SEPTENARY, a. *sep'tĕn-ĕr-ĭ* [L. *septenārĭus*, consisting of seven—from *septēnī*, by sevens; *septem*, seven: F. *septénaire*]: consisting of seven: happening once in seven years; lasting seven years: N. the number seven.

SEPTENATE, a. *sĕp'tĕn-āt* [L. *septēnī*, seven each—from *septem*, seven]: in *bot.*, having parts in sevens—as a compound leaf with seven leaflets coming from one point.

SEPTENNIAL, a. *sĕp-tĕn'nĭ-ăl* [L. *septem*, seven; *annus*, a year]: lasting or continuing for seven years: returning once every seven years. SEPTEN'NIALLY, ad *-lĭ*.

SEPTENTRION, n. *sĕp-tĕn'trĭ-ŏn* [F. *septentrion*—from L. *septen'trĭōnes,* the north—from *septem,* seven; *trĭōnes,* the plowing oxen—seven stars near the north pole]: in *OE.,* the north: ADJ. northern. SEPTEN'TRIONAL, a. *-ŏn-ăl,* in *OE.* northern.

SEPTIC, a. *sĕp'tĭk* [Gr. *sēptĭkos,* that causes putrefaction—from *sēpō,* I make putrid or rotten]: having the power to promote putrefaction. SEP'TICALLY, ad. *-lĭ.* SEPTICITY, n. *sĕp-tĭs'ĭ-tĭ,* the tendency to promote putrefaction. SEPTICÆMIA, n. *sĕp'tĭ-sē'mĭ-ă,* or SEPTÆMIA, n. *sĕp-tē'mĭ-ă* [Gr. *haima,* blood]: acute disease, resembling pyæmia in its general characters, caused by absorption into the blood of certain non-pus-forming bacteria. The disease is called also ICHORRHÆMIA, *īk'ŏr-rē'mĭ-ă* [Gr. *ichōr,* corrupted matter; *haima,* blood]. See PYÆMIA; also BLOOD-POISONING.

SEPTICIDAL, a. *sĕp'tĭ-sī'dăl* [L. *septum,* a partition; *cædo,* I cut or divide]: in *bot.,* applied to seed-vessels which open by dividing through the septa of the ovary.

Septicidal Dehiscence: *v,* valves; *d,* dissepiments; *c,* axis.

SEPTIFEROUS, a. *sĕp-tĭf'ĕr-ŭs* [L. *septum,* a partition; *fero,* I bear]: containing septa; having partitions.

SEPTIFORM, a. *sĕp'tĭ-fawrm* [L. *septum,* a partition; *forma,* shape]: resembling a septum or partition.

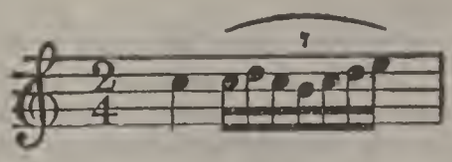
SEPTIFRAGAL, a. *sĕp-tĭf'ră-găl* [L. *septum,* a partition; *frango,* I break]: in *bot.,* applied to a dehiscence which takes place along the lines of suture, the valves at the same time separating from the dissepiments, which are not sub-divided.

SEPTILATERAL, a. *sĕp'tĭ-lăt'ĕr-ăl* [L. *septem,* seven, and *latus,* a side, *latĕris,* of a side]: having seven sides.

SEPTILLION, n. *sĕp-tĭl'yŭn* [L. *septem,* seven, and Eng. *million*]: in *arith.,* a million raised to the seventh power; in *Eng. notation,* expressed by a unit followed by 42 ciphers—in the *It.* or *F.,* by a unit and 24 ciphers.

SEPTIMAL, a. *sĕp'tĭ-măl* [L. *septĭmus,* seventh; *septem,* seven]: relating to the number seven.

SEPTIMOLE, *sĕp'tĭ-mōl,* in Music: group formed when a note is divided into seven instead of four parts—e.g., a



minim into seven quavers, or a crotchet into seven semiquavers. The figure 7 is usually placed over it. A septimole may occur also in a 6-8 measure, in which case the seven notes are collectively of the value, not of four, but of six.

SEPTINE, n. *sĕp'tīn* [Gr. *sēptē*, means of producing decay]: in *pathol.*, organic poison. SEPTINOUS, a. *sĕp'tĭ-nŭs*, produced by organic poison.

SEPTUAGENARIAN, n. *sĕp'tū-ă-jĕn-ā'rĭ-ăn* [mid. L. *septuagenārĭus*—from L. *septŭagēnī*, seventy each—from L. *septŭagin'ta*, seventy]: a person seventy years of age. SEP'TUAG'ENARY, a. *-ăj'ĕn-ĕr-ĭ*, consisting of seventy: N. the number seventy.

SEPTUAGESIMA, n. *sĕp'tū-ă-jĕs'ĭ-mă*, i.e., Septuagesima Sunday [L. *septŭages'ĭmus*, 70th]. third Sunday before Lent (q v.)—so called because 70 days (in round numbers) before Easter. SEP'TUAGES'IMAL, a. *-ĭ-măl*, consisting of seventy; counted by seventies. SEP'TUAGES'IMALLY, ad. *-lĭ*.

SEPTUAGINT, n. *sĕp'tū-ă-jĭnt*, or THE SEVENTY, or ALEXANDRINE VERSION (often denoted by LXX.) [L. *septŭagin'ta*, seventy]: most ancient extant Greek translation of the Hebrew Old Test., and the one in common use in Palestine in the time of Christ : ADJ. pertaining to the Septuagint, or contained in it.—The *Septuagint*, as to its origin, is shrouded in obscurity. The principal myth about it—repeated by Philo, Josephus, the Talmud, and the Church Fathers (Justin, Clement of Alexandria, Epiphanius, etc.), with individual variations—is in a letter purporting to be written by a Greek, Aristeas, to his brother, Philokrates, during the reign of Ptolemy Philadelphus (B.C. 284–247). This king, the letter says, anxious to embody in a collection of laws of all nations, on which he was engaged, those of the Jews also, invited, by the advice of his librarian, Demetrius Phalereus, 72 men of learning and eminence from Palestine, who performed the task of translation from the original Hebrew (on the isle of Pharos) in 72 days. This legend is utterly rejected as history, and the letter is proved beyond all question spurious. The legend, however, had doubtless some basis of facts from which it was developed; but these facts it is not now possible to ascertain. So much, however, seems clear from another anterior testimony (Aristobulos), that Ptolemy did cause a Greek version of the Pentateuch to be executed, probably during the time of his being co-regent of Ptolemy Lagi. That the translator or translators, however, were not Palestinian but Egyptian Jews, appears equally clear both from the state of the text from which their translation must have been made, and from the intimate acquaintance with Egyptian manners and customs which it evinces. This text differs, especially in the Pentateuch, considerably from our received text, but agrees in many instances with the Samaritan (q.v.). The question of the number of translators has been much discussed, with little positive result. So much only seems certain, that different hands were employed in rendering the different parts of the Pentateuch, on which immense care was bestowed, as well as of the other books of the Old Test., though the other books do not seem to have been done at the same time. In some instances, it appears as if the translation had been made before the non-penta

teuchial books were united with the others into one canon. This seems evident in the case particularly of the book of Jeremiah, which, in the translation, appears in a more primitive form than that in which we possess it now. In less degree does this discrepancy appear in Job, the Proverbs, Daniel, and Esther; of these, however, our canon probably contains the original form, while the LXX. shows later variants. It is, however, in none of these books to be decided now whether the discrepancies observable are due to an already altered text on which the translators worked, or whether the translators were their own emendators; or even whether many of the changes are not due to a much later period. The translation of the book of Daniel is the most flagrant instance of subsequently introduced 'corrections' and additions. Apart from the apocryphal pieces attached to it, its obscure passages were 'emendated' to such an extent, by both Jews and Christians, that it was by the authority of the early church utterly rejected, and replaced by the version of Theodotion. The translator of Job, though less arbitrary, has yet altered, added to, and abbreviated considerably, his text. Esther has many apocryphal additions, which owe their origin probably to the Alexandrine period, and never existed in Hebrew. Of exaggerated literalness is the version of Ecclesiastes and the Psalms. Among the most successful books are the Psalms and Ezekiel. But, on the whole, there is noticeable throughout a lack of exact knowledge of the original; a striving after minute fidelity in one part, and an unbridled arbitrariness in another; further, a desire to tone down or to utterly eliminate anthropomorphisms or anything that appeared objectionable to the refined taste of the time.

The Septuagint was held in the very highest repute among the Alexandrine Jews, while the Palestinians at first regarded it as a dangerous innovation, and even instituted the day of its completion as a day of mourning. Gradually, however, it found its way into Palestine also; and at the time of the composition of the New Test., it seems almost to have superseded the original, considering that the New Test. quotations from the Old Test. are almost invariably given from the LXX. It was read and interpreted in the synagogues for several centuries after Christ, until the increasing knowledge of the original, fostered by the many academies and schools, and the frequent disputations with the early Christians, brought other and more faithful literal translations, such as those of Aquila, Theodotion, etc., into use, and gradually the LXX. was altogether discarded in the synagogue. It was unwelcome to Jews first because of its too evident divergence from the accepted text, and secondly because it had been adopted as a secret scripture by the Christians. The church, however, for a long time, and the Greek Church to this day, considered it as of equal authority and inspiration with the Hebrew text itself; and many

translations were made from it into the vernaculars of different Christian communities (the Itala, the Syriac, the Ethiopian, Egyptian, Armenian, Georgian, Slavonian, etc.). The large diffusion of the LXX. among the Hellenists and in the churches, and the lack of anything like a critically fixed text, together with the pious desire bodily to insert the peculiar explanation given to obscure passages by single authorities, the ignorance of the copyists, and a number of other causes, contributed not a little to render the MSS. corrupt, in some instances past mending. Nor were the endeavors of Origen (q.v.) in his *Hexapla*, or of Lucianus and Hesychius, for restoration of the proper text, of any avail.

The study of the Septuagint is very important as the starting-point for the history of Jewish interpretation of the Scriptures. Also the Septuagint preserves some ancient Hebrew books which were excluded from the canon. It presents to us the dialect of biblical Greek under systematic rules, and is a lexical help in our interpretation of the New Test. And chiefly it is a help as furnishing the only version with which we can compare the Masoretic text of the Old Test.—The principal MSS. that have, as far as we know, survived are the Codex Alexandrinus in the Brit. Museum, the Codex Vaticanus in Rome, and the Sinaitic Codex (imperfect) in St. Petersburg; all dating between the 4th and 6th century. The principal editions are the Complutensian (1514-17), reprinted in the Antwerp and Paris Polyglot; the Aldine of Venice (1518); the Sixtine of Rome (1687), partly reprinted in Walton's Polyglot (1657) by Lam Bos. (Franeker 1709); Reineccius (Leip. 1730); Parsons and Holmes (Oxford 1798-1827); Tischendorf (1850, etc.). Following more closely the Codex Alexandrinus is the edition of Grabe (Oxford 1707-20, completed by F. Lee), reprinted by Breitinger (Zurich 1730-32) and others. The Alexandrine Codex has been reproduced in fac-simile by H. H. Baber; the Sinaitic in the same manner by Tischendorf. Some other MS. recensions are mentioned by the early Fathers; e.g., the 'Hebrew,' the 'Syrian,' the 'Samaritan,' the 'Hellenian,' etc. The literature of the LXX. is very large, and special grammars and dictionaries have been compiled for its peculiarly corrupt idiom. Attempts to render the Bible into Greek were made about the beginning of the 15th century, a portion of which is found in St. Marks, Venice, and edited by Oscar Gebhardt ('Graecus Venetus,' 1875). Revisions of the Septuagint were made by Aquila, fragments being extant, with citations by Christian writers from Origen's *Hexapla;* by Theodotion, less pedantic than Aquila, fragments being preserved in Origen; and by Symmachus, the best stylist of all. Little is known of the three other fragmentary translators used by Origen in compiling his *Hexapla.*

SEPTULATE, a. *sĕp'tū-lāt* [L. *septum*, a partition

(see SEPTUM)]: in *bot.*, applied to fruits having spurious transverse dissepiments or partitions. SEP'TULUM, n. *-lŭm*, a division between small spaces or cavities.

SEPTUM, n. *sĕp'tŭm*, SEP'TA, plu. *-tă* [L. *septum*, a partition—from *sepĭō*, I fence; *sepes*, a hedge]: in *bot.*, any partition separating a body, as a fruit into two or more cells in the direction of its length—separating partitions across or in the direction of its breadth are called *phragmata;* in *anat.*, the membrane or plate separating from each other two adjacent cavities or organs; one of the partitions or walls of a chambered shell. SEP'TULÆ, n. plu. *-tū-lē*, a dimin. of septum.

SEPTUPLE, a. *sĕp'tū-pl* [F. *septuple*—from L. *septem*, seven; *plico*, I fold]: sevenfold: V. to make sevenfold. SEP'TUPLING, imp. *-plĭng*. SEP'TUPLED, pp. *-pld*.

SEPUL'CHRAL MOUND: mound of earth or stone over the resting-place of the dead. The rearing of such mounds may be traced to remote antiquity. It had doubtless its origin in the heap of earth displaced by interment, which, in the case of the illustrious warrior or chief, it became the practice to raise into the size and form of the barrow or tumulus which is found all over n. Europe, from Great Britain and Ireland to Upsula in Sweden and the Steppes of Ukraine. Sepulchral mounds of some sort seem, indeed, to have been erected among all the nations of Asia as well as of Europe, and they are found in numbers in Central America. The sepulchral mounds which seem of latest date are broad and low, surrounded sometimes by an earthen vallum, and sometimes, particularly in Scotland and Scandinavia, by a circle of standing stones. In both are inclosed and encircled tumuli; weapons have been found belonging to the period when the metallurgic arts were practiced, and in some instances Roman as well as native relics. A remarkable form of tumulus frequent in Sweden, and occasionally seen in Scotland, consists of an oblong mound larger than the primitive barrow, and terminated at both ends in a point, whence it has been called the *skibs ælunger*, or ship-barrow. Scandinavian antiquaries have come to the conclusion that the bodies of the warriors of the deep were sometimes burned in their ships, whose form was repeated in the earth-work reared above their ashes.

The most numerous class of sepulchral mounds in Scotland are the *Cairns* (q.v.) or tumuli of stone, which abound in every district, and were often much larger than the earthen tumuli. Another species of monument is the *Cromlech* (q.v.).

SEPULCHRE, n. *sĕp'ŭl-kėr* [OF. *sepulchre*—from L. *sepulcrum*, a tomb—from *sepel'ĭō*, I bury: It. *sepolcro:* F. *sépulcre*]: a place of interment; a tomb; a grave: V. to bury; to inter. SEP'ULCHRING, imp. *-krĭng*. SEP'ULCHRED, pp. *-kėrd*. SEPULCHRAL, a. *sĕ-pŭl'krăl*, pertaining to burial, or to tombs or monuments; deep, grave, or dis-

agreeably hollow, generally applied to a tone of voice. SEPUL'CHRALLY, ad. *-lĭ.* SEPULTURE, n. *sĕp'ŭl-tūr* [F.—L. *sepultūra,* an interment]: interment; burial.

SEP'ULCHRE, THE HOLY. See HOLY PLACES.

SEPULVEDA, *sā-pôl'vā-thâ,* JUAN GINES DE: Spanish historian, surnamed the Livy of Spain: about 1490-1573 or 4; b. Pozo-blanco, near Cordova. He studied first at Cordova and Alcala, and went to Bologna 1515, where he wrote the life of Cardinal Albornoz, pub. 1521. He assisted Cardinal Cajetan at Naples in revising the Greek text of the New Test., and 1536 returned to Spain as chaplain and historiographer to Charles V., and preceptor to his son, afterward Philip II. Sepulveda seems to have been one of the most learned men and best writers of his time. His works comprise Latin translations, and miscellaneous dissertations. His histories of the Reign of Charles V., of Philip II., and of the Conquests of the Spaniards in Mexico, all in Latin, are still inedited. His other works were pub. by the Royal Acad. of History, Madrid, 1780 (4 vols. fol.).

SEQUACIOUS, a. *sĕ-kwā'shŭs* [L. *sequax* or *sequācem,* following or seeking after—from *sequi,* to follow]: not moving on independently; following; attendant; logically consistent and rigorous; in *OE.,* ductile; pliant. SEQUA'CIOUSNESS, n. *-nĕs,* or SEQUACITY, n. *sĕ-kwăs'ĭ-tĭ,* disposition to follow; act of following.

SEQUEL, n. *sē'kwĕl* [F. *séquelle*—from L. *sequēla,* a result of consequence—from *sequor,* I follow: It. *sequela*]: that which follows; consequence; result; event; conclusion. SEQUELA, n. *sē'kwē-lă,* in *med.,* a diseased state following on an attack of some other disease. SEQUE'LÆ, n. plu. *-lē,* disordered conditions of society following upon severe famine and widespread fatal disease.

SEQUENCE, n. *sē'kwĕns* [F. *séquence*—from L. *sequens* or *sequen'tem,* following—from *sequor,* I follow]: that which follows; order of succession; series; arrangement; a set of cards of the same suit in order; in *music,* a regular alternate succession of similar chords; in *Rom. Cath. Chh.,* a hymn introduced into the Mass on certain festival days *after* the gradual—whence the name. SEQUENT, a. *sē'kwĕnt,* in *OE.,* following; succeeding; consequent: N. in *OE.,* a follower. SEQUENTIAL, a. *sĕ-kwĕn'shăl,* being in succession. SEQUEN'TIALLY, ad. *-lĭ.*

SEQUESTER, v. *sĕ-kwĕs'tĕr* [F. *séquestrer,* to sequester—from L. *sequestrārĕ,* to give up for safe-keeping]: to separate from others; to withdraw or retire; as, from society; to seclude; to sequestrate. SEQUES'TERING, imp. SEQUES'TERED, pp. *-tĕrd:* ADJ. secluded; retired. SEQUES'TRABLE, a. *-trā-bl,* capable of being sequestered or separated. TO SEQUESTER ONE'S SELF, to separate one's self from society; to seclude one's self for the sake of privacy. SEQUES'TRATE, v. *-trāt* [L. *sequestrātus,* removed,

separated from anything]: especially in *eccles. usage,* to appropriate by legal process the property and income of an incumbent until the claims of certain creditors are satisfied; to set aside from the power of either party the matter at issue by order of a court of law; in *Scotch law,* to take possession of the estate of a bankrupt or insolvent with the view of realizing it and distributing it equitably among the creditors. SEQUES'TRATING, imp. SEQUES'TRATED, pp.: ADJ. taken possession of for behoof of creditors. SEQUESTRATION, n. *sĕk'wĕs-trā'shŭn* [F.—L.]: esp. in *eccles. practice,* the act or state of taking possession of a benefice by legal process, in order to satisfy the claims of creditors; deprivation of the use and profits of a possession; in *OE.,* state of being set aside. SEQ'UESTRA'TOR, n. *-trā'tėr,* one who sequestrates.

SEQUESTRUM, n. *sĕ-kwĕs'trŭm* [L. *sequester,* a mediator (see SEQUESTER]: in *surg.,* a dead portion of bone which separates from the sound part.

SEQUIN, n. *sē'kwĭn* [F. *sequin;* It. *zecchino,* a sequin —from It. *zecca,* the mint—from Ar. *sikkat,* a die for coins]: a gold coin of Italy, struck first at Venice about the end of the 13th century. It was about the size of a Ducat (q.v.), and was equivalent to about $2.30. Coins of the same name, but varying in value, were issued by other states.

SEQUOIA: a genus of *Coniferæ,* included in the subfamily *Taxodioidæ,* of which the other genus is the *Taxodium* or deciduous cypress. The Sequoia genus (named in honor of the Cherokee chief Sequo-yah, who invented the alphabet of that tribe), was for a time known as *Taxodium* or *Wellingtonia;* it comprised two species, *S. sempervirens,* the redwood, and *S. gigantea,* the 'big-tree,' both natives of California. The genus was once widely distributed, as fossil remains testify, and the petrified forest in Arizona is stated to be composed of species of sequoia. The flowers of the sequoias are monœcious and are borne in scaly inflorescences as terminal or axillary shoots in such great profusion, that the pollen covers the ground beneath the trees during their winter blooming. The pistillate flowers mature into a fruit, or oval cone, having persistent woody scales, broadened at their outside end into a rhomboidal flat top, very much wrinkled, and with a slightly prickle-tipped apex. Their scales are slightly separated to allow the many brown, compressed seeds to escape and then spin away on their lateral wings. The leaves are acute, compressed and keeled, decurrent on the stem, alternate and inserted in spirals, very scale-like on the branchlets, but on older branches, linear and spreading.

The redwood, which was the first *Sequoia* discovered, is the more common species, and grows along the Pacific coast just so far inland as the sea-fogs can go. It is a very straight, handsome tree, with columnar trunk, and

spreading branches and branchlets, and reaches in some instances as great a height as the other and more famous species. (See REDWOOD.)

Sequoia gigantea, the 'big-tree of California,' is more rare. It is found in 10 small groves, forming an uninterrupted 'belt' extending for 200 miles on the western slope of the Sierra Nevada Mountains, and nowhere else in the world. The Calaveras grove near the northern extremity of this series, is the most picturesque and important group of big trees, and was first discovered by J. Bidwell in 1841. These famous trees are the most massive of any in the world, but are not the tallest, being surpassed by the *Eucalyptus* trees of Australia. They are practically exempt from disease, and, if they were not injured by fire and by man, would have apparently an almost endless life. Some of them are judged, by the number of annual rings, to have been thousands of years old. Fully grown trees average a height of 275 feet, and a diameter of 25 feet. One of the most gigantic, cut down, with great difficulty, in 1853, was 302 feet in height, 96 feet in circumference, and after the bark was removed (which was itself nearly 18 inches thick), the diameter of the solid wood in the stump was 25 feet, 6 feet from the ground. This stump was used as a dancing floor, holding 40 or more persons. Others have been estimated as between 350 and 400 feet high.

The younger sequoias are very graceful, and charming in their dark blue-green foliage, being often grown in English and European parks. They have a straight, tapering stem from which the branches spring to form a narrow spire-like pyramid. After a few hundred years they begin to lose their branches, and become dome-like. Ultimately they become our picturesque trees, with a great trunk enlarged at the base, and strongly buttressed, fluted with low, broad ridges, and covered with cinnamon brown bark (purple-tinted in the shadow) which follows the contour of the lobed trunk, and is deeply, longitudinally furrowed, and separated into fibrous scales on the ridges. This tapering shaft is naked for 100 or more feet, when great branches, eccentric in development, join in constructing the narrow, but massive domes which stand out above the other tall trees of the Sierras.

SEQUOYAH, or GEORGE GIST, or GUESS: Cherokee Indian inventor; b. about 1770; d. near San Fernandino, Northern Mexico, 1842. He exercised his ingenuity in numerous ways,—as silversmith, blacksmith, artist. In 1821 he completed the Cherokee alphabet, for which he received in 1823 a silver medal from the Cherokee general council. This alphabet was perfectly adapted to the peculiarities of the Cherokee tongue, which it expressed as the English alphabet never could. He borrowed many symbols from an English speller. His alphabet was quickly adopted and was very successful.

SERAGLIO, n. *sĕ-răl'yō*, properly *Seraï* [It. *serraglio*, an inclosure of palisades, a place shut in—from *serrare*, to lock in—from L. *sera*, a bar; *sero*, I join: afterward confused with Pers. *seraï*, a palace: F. *sérail*, a seraglio]: the palace of the grand seignior or sultan of Turkey: place or house for keeping wives and concubines; a harem—hence, a house of licentious pleasure.—The *Seraglio* of the sultan at Constantinople stands in a beautiful situation on a head of land projecting into the sea, on the shore of the Golden Horn; and is inclosed by walls 7½ m. in circuit. Within the walls are a variety of mosques, gardens, and large edifices, capable of containing 20,000 persons, though the whole number of the inhabitants scarcely ever reaches half of this. The principal entrance (*Babi Humayun*, or Sublime Gate) is a kind of pavilion, constantly guarded by *capidjis*, or officers of the S.; and the chief of the large edifices within is the *harem* [Ar., sacred spot], which is distinctly separated from the rest of the S., and consists of a group of houses and gardens, one of each being possessed by each of the sultan's wives, and of the habitations of the concubines and slaves. The harem is ruled by the *kiaja-khatun*, or inspector of the women, who is under the sultan's authority alone, and is supplied with what they require by the *kislar-aga*, or chief of the black eunuchs, who form the principal or inner guard of the harem. The second and outer guard is given to the white eunuchs, under their chief, the *kapu-agassy* or *kapu-oghlan*. Other classes of household officers are the *mutes* (Turkish, *bisebân* or *dilssis*), who, till recently, were the executers of the sultan's orders, especially those in which secrecy was required; the *bostanjis*, or gardeners; the *baltajis*, or cleavers of wood; and the *itsh-oghlans*, or attendants of the sultan. The sultan's mother always resides within the S., but his sisters do not. Access may easily be had to the S., except the harem, which is scrupulously guarded from even the eyes of strangers. The English have improperly confounded the two terms 'seraglio' and 'harem.'

SERAI, n. *sĕ-rī'* [Pers. *seraï*, a palace, an inn]: in *India* and *Tartary*, a resting-place for the accommodation of travellers; a caravansary.

SERAING, *sĕh-răng'*: town of Belgium, province of Liége, between three and four m. s.w. from Liége, on the right bank of the Meuse; on the railway between Namur and Liége. It is connected by a handsome suspension-bridge with the village of Jemeppe, on the left bank of the Meuse. S. is a place of great activity, and contains a manufactory of steam-machinery, locomotives, etc., one of the largest in the world. This manufactory was established by an Englishman, John Cockerill, 1816; the king of Holland, to whose dominions Belgium then belonged, joining in the enterprise. After the revolution of 1830, Cockerill bought the shares belonging to the king of Holland. On his death 1840, a company was formed, *La John Cockerill Société*, to which the works now belong. They occupy the former palace of the prince-bishops of Liége, which still forms their front, the extensive gardens behind it having been

covered with buildings, where all processes of machine-making are carried on. Forty or fifty tall chimneys are clustered on this spot. The town depends on these works for its prosperity. Pop. (1890) 33,912; (1900) 38,468.

SERA'JO, or SERAIEVO. See BOSNA-SERIA.

SERAL, a. *sē'ral* [L. *sero*, late]: in *geol.*, late; an epithet expressing the period of the nightfall or late twilight of the Appalachian Paleozoic day. The coal-measures of N. America occupy an area of 200,000 sq.m., and range from 3,000 ft. to such thickness as to be unworkable. From the fossils it is evident that the Appalachian Seral series is the equivalent of the European Carboniferous series.

SERALBUMEN, n. *sĕr'ăl-bū'mĕn* [Eng. *serum*, and *albumen*]: a name given to the albumen of the blood to distinguish it from the albumen of the egg, called *ovalbumen*.

SERAMPORE, *sĕr-am-pōr'*, or SERAMPUR: neat town of Brit. India, built in European style, extending a mile along the right bank of the Hooghly, 14 m. n. of Calcutta. Paper is here manufactured in large quantity. S. was at one time a Danish settlement, but was transferred by purchase to the Brit. 1845. Pop. about 26,000.

SERANG'. See CERAM.

SERAPE, n. *sĕ-râ'pĕ* [Sp.]: a blanket or shawl worn as an outer garment by the Mexicans and other natives of Spanish N. America.

SERAPEUM, *sĕr-a-pē'ŭm* (Gr. *Serapeion* or *Sarapeion*): temple named in honor of Serapis (q.v.). Several such temples are known to have existed in the ancient world. The most remarkable was that of Alexandria, situated s. of the canal, and outside the walls of the city, and superseded an older temple at Rhacotis. Hither was transported the statue of Dis or Pluto from Sinope by Ptolemy I., and attached to it was the celebrated Alexandrian Library (q.v.). The S. at Memphis attained scarcely less reputation, and comprised a group of temples dedicated to Astarte, Anubis, Imouthos or Æsculapius, and Serapis. It was approached from the city of Memphis by an avenue of sphinxes, which had already become partially buried in the sands in the days of Strabo, and were discovered by M. Mariette 1850, who, after a series of excavations, uncovered the ruins, and discovered the cemeteries of the mummied Apis or Bulls sacred to Ptah and Osiris at Memphis. Close to the S. was the Apeum, or temple of the living Apis, in which the bull lived, as well as the cow which had produced him. The S., or, as it was called in Egyptian, the abode of *Osor-hapi*, or the Osiris-Apis, was, in fact, the sepulchre of the bull. The most remarkable part of the work, which was of great extent, was the subterranean tombs of the mummies of the Apis, consisting of galleries with numerous chambers, in which the remains of these bulls had been deposited from the reign of Amenophis III. of the 18th dynasty, about B.C. 1400, till the time of the Romans. Two principal galleries contained the tombs. The second gallery, commenced in the 53d year of Psammetichus I., was

on a grander scale than the first, with larger sepulchral chambers, and magnificent sarcophagi of granite, some measuring 12 ft. high, 15 ft. long, and weighing many tons. During the reign of the Persians, and subsequently, the chambers were of less size, and the monuments exhibit the general decadence of the arts. The Apis, considered as the incarnation of the god Ptah during life, received royal and divine honors after death; his body, or the principal portion, being embalmed, and a sepulchral tablet or tombstone placed on his sepulchre, with other tablets of different worshippers, who adored his divinity, and dedicated them to the deceased bull. As the principal tombstone of the bull contained the dates of the king's reign in which he was born or discovered, enthroned in the Apeum, and died or was buried in the S., these tablets have become an important element for the chronology of the 19th and subsequent dynasties, and have aided to fix some hitherto doubtful points of chronology. They terminate with Ptolemy Euergetes II., B.C. 177. The tablets, votive and sepulchral, numbered about 1,200; the most remarkable are at present in the Museum of the Louvre at Paris. Numerous bronze figures and other antiquities were found during the excavations, comprising costly objects of jewelry, many of which also are in the Louvre. Besides these, several Greek papyri which appear to have formerly belonged to the library or archives of the S. were previously known, and many have been published. These throw great light upon the constitution of the hierarchy of the S., among which was a kind of order of monks, who lived within the precincts of the building, beyond which they did not go, and subsisted on alms or the contributions of their family.—Mariette, *Serapeum de Memphis* (4to Paris 1856); *La Mère d'Apis* (4to Paris 1856); *Athen. Fran.* (4to Paris 1855–6); Lepsius, *Ueber den Apis-kreis, Zeitsch. d. Morg. Gesell.* (8vo Leip. 1853).

SERAPH, n. *sĕr'ăf* [conjecturally from Heb. *saraph*, to burn—possibly from an Arabic term denoting *high, exalted:* It. *serafino:* F. *séraphin*]: high order of celestial beings: Heb. plu. SER'APHIM, *-ă-fim:* Eng. plu. SERAPHS: sometimes the plu. is written *seraphims*, but improperly. The Seraphim were celestial beings in attendance on Jehovah, mentioned only Is. vi. 2. They have some resemblances to the Cherubim (q.v.), have the human form—face, voice, two hands, and two feet—but six wings, with four of which they cover their face and feet—as a sign of reverence—while with two they fly. Entirely uncertain is the origin of this conception, or of the word which expresses it: their office of singing the praises of Jehovah on his throne, and of being the swift messengers between heaven and earth, gives little explanation of it. They may probably be classed, not with the angels, who are presented as living personal beings, but with the cherubim (see CHERUB), as poetic symbols, vision-emblems of the splendor and power of Jehovah's majesty. Deserving of consideration, in view of the close contact between Judæa and Assyria and Babylon both before and after the Captivity, is a com-

parison between the seraphim and sculptures of winged men and beasts brought to light in these last-named countries. SERAPHIC, a. *sĕ-răf'ĭk*, or SERAPH'ICAL, a. *-ĭ-kăl*, angelic; pure; sublime; inflamed with love or zeal. SERAPH'ICALLY, ad. *-lĭ*. SERAPHINE, n. *sĕr'ă-fĭn*, keyed musical instrument in which the sounds were produced by action of wind on free vibratory reeds. It was the precursor of the Harmonium (q.v.).

SERAPIS, *sē-rā'pĭs*, or SARAPIS, *sa-rā'pĭs:* Greek name of an Egyptian deity, introduced into Egypt in the time of Ptolemy I., or Soter. This monarch is said to have seen the image of a god in a dream, commanding him to remove it from the place where it was; and Sosibius, a traveller, having recognized the image as existing at Sinope, Soteles and Dionysius were sent from Egypt, and brought it from Sinope to Alexandria. On its arrival, it was examined by Timotheus the interpreter and the celebrated Manetho, who called it Serapis, and appear to have identified it with Osorapis, or Osiris united with Apis, i.e., Osiris in his character of the Egyptian Pluto, as a deity of similar character. The figure, in fact, appears to have been one of Hades or Pluto, having at its side Cerberus and a dragon or snake. According to some authorities, the statue of S. was sent to Ptolemy II., or Philadelphus, because that monarch had relieved the city of Sinope from famine by supplying it with corn, and the statue was placed in the Serapeum (q.v.) at the promontory of Rhacotis. The S. of the Ptolemaic period, however, was not an Egyptian but a Greek deity, whose temple was not admitted into the precincts of Egyptian cities, and found favor only in the Greek cities founded in Egypt. It is said that 42 temples were erected under the Ptolemies and Romans to this god in Egypt. His resemblance to Osiris consisted in his chthonic or infernal character, as judge of the dead and ruler of Hades. About his nature and attributes the Greeks themselves entertained very different ideas, some considering him allied to the Sun, others to Æsculapius or Hades. The god had a magnificent temple at Alexandria, to which was attached the celebrated Library; another at Memphis, in the vicinity of the cemetery of the mummies of the Apis, which has been excavated by M. Mariette; and another at Canopus. From recent discoveries, it appears that he represented or was identified with the Hesiri Api, or Osor-apis, the 'Osirified' or 'dead Apis,' who was also invested with many of the attributes of Osiris, and considered, while living, to be the incarnation of the god Ptah Socharis-Osiris, the tutelary divinity of Memphis. The worship of S., introduced into Egypt by the Ptolemies, subsequently became greatly extended in Asia Minor; and his image, in alliance with that of Isis and other deities, appears on many of the coins of the imperial days of Rome. In A. D. 146 the worship of the god was introduced into the city of Rome by Antoninus Pius, and the mysteries celebrated on

Serapis.
From a Seal in the Brit. Museum.

May 6; but they were soon abolished by the senate, on account of their licentious character. A celebrated temple of Serapis was also at Puteoli (Pozzuoli), near Naples, and the remains of it are still seen, and present curious geological phenomena. In Egypt itself, the worship of the deity subsisted till the fall of paganism, the image at Alexandria continuing to be worshipped till destroyed, 398, by Theophilus, abp. of that town. Busts of Serapis are found in most museums, and his head or figure engraved on certain stones was supposed to possess particular mystic virtues. His temples were oracular, the votaries consulting him by sleeping and dreaming in them.

SERASKIER, or SERASQUIER, n. *sĕ-răs'kēr* [F. *séras-quier*—from Pers. *ser*, head, chief; *asker*, an army]: name given by the Turks to every general having the command of a separate army; and, in particular, to the commander-in-chief or minister of war of the Sublime Porte. SERAS'KIERATE, n. *-kēr-āt*, office of the seraskier.

SERB, n. *sĕrb* [native name]: native or inhabitant of Servia.

SERE, a. *sēr* [see SEAR]: dry; withered.

SEREIN, n. *sĕr'īn* [F., evening dew—from L. *sērum*, a late hour: confused with L. *serēnus*, bright, clear]: a kind of fine rain or heavy dew which falls sometimes in a clear sky.

SERENADE, n. *sĕr'ĕ-nād'* [F. *sérénade*—from It. *serenata*, a serenade—from It. *sereno;* L. *serēnus*, open, fair, clear—applied to the weather or the open air, espec. of a calm, clear night, as opposed to indoors]: an entertainment of music given by a lover in a spirit of gallantry under the window of his lady-love at night; in *Ger.*, a musical tribute given at night by students to a favorite professor under his window; soft music performed in the streets during the stillness of night, practiced chiefly in Spain and Italy: a musical piece suitable for such an occasion, called sometimes *Nottorno:* V. to entertain with open-air music at night. SER'ENA'DING, imp.: N. the act or practice of performing music in the open air at night. SER'ENA'DED, pp. SER'ENA'DER, n. *-dĕr*, one who serenades. SER'ENA'TA, n. *-nâ'tă* [It.]: any piece of vocal music on the subject of love; an orchestral work in symphony form; pastoral cantata.

SERENE, a. *sĕ-rēn'* [L. *serēnus*, fair, bright, serene: It. *sereno:* F. *serein*, serene]: clear and calm; still; peaceful; unruffled; even-minded; calm in temper; a title or form of address restricted to the sovereign princes of Germany and the members of their families, as *Serene Highness, Most Serene:* N. clearness; tranquillity. SERENELY, ad. *-lĭ*. SEREN'ITY, n. *-rĕn'ĭ-tĭ*, clearness and calmness; peace; calmness of mind. SÉRÉNISSIME, n. *sā'rān-ĭs'sēm* [F.—It. *serenissimo*]: most serene, as a form of address.

SERF, n. *sêrf* [F. *serf*, a bondsman—from L. *servus*, a slave: It. *servo*]: lowest class of servants or slaves in the middle ages, who were attached to the soil and transferred with it; in *Russia* till 1863, one of the peasant class. SERF'AGE, n. *-āj*, or SERF'DOM, n. *-dŏm*, state or condition of a serf.—The *Serfs* or villeins were a numerous class of the population of Europe, who were in a state of slavery during the early middle ages. See SLAVERY. In some cases, this serf population consisted of an earlier race, who had been subjugated by the conquerors; but there were also instances of persons from famine or other pressing cause selling themselves into slavery, or even surrendering themselves to churches and monasteries for the sake of the benefits to be derived from the prayers of their masters. Different as was the condition of the serf in different countries and at different periods, his position was on the whole much more favorable than that of the slave under the Roman law. He had certain acknowledged rights—and this was the case particularly with the classes of serfs who were attached to the soil. In England, prior to the Norman conquest, a large proportion of the population were in a servile position, either as domestic slaves or as cultivators of the land. The name *nativus*, generally applied to the serfs, seems to indicate that they belonged to the native race, earliest possessors of the soil. The powers of the master over his serf were extensive, their principal limitations being, that a master who killed his serf was bound to pay a fine to the king, and that a serf deprived of his eye or tooth by his master was entitled to his liberty. The Norman conquest made little change in the position of the serf. The lowest class of serfs were the *villeins in gross*, who were employed in menial household services, and were the personal property of their lords, who might sell them or export them to foreign countries; while the most numerous class, employed in agriculture and attached to the soil, were called *villeins regardant*. These latter, though in some respects in a better position than the villeins in gross, might be severed from the land and conveyed apart from it by their lord. They were incapable of anything like a complete right to property; inasmuch as it was held, in accordance with the principles of the Roman law, that whatever the slave acquired was his *peculium*, which belonged to his lord, who might seize it at his pleasure. By a peculiarity in the usages of Britain, the condition of a child as regards freedom or servitude followed the father, and not the mother; therefore the bastards of female villeins might be free. In France and Germany, besides the classes of serf alluded to, there were others whose servitude was milder, and who were bound only to fixed duties and payments in respect of their lands.

The abolition of serfdom in w. Europe was a very gradual process, and the result of various causes. The church both inveighed against the practice of keeping Christians in bondage, and practiced manumission to a large extent. In the course of time, usage greatly modi-

fied the rights and liabilities of the serf, whose position must have been considerably altered when we find him making stipulations regarding the amount of his services, and purchasing his own redemption. The towns afforded in more than one way a means of emancipation. A serf residing a year in a borough without challenge on the part of his lord became *ipso facto* a free man; and the result of experience showed that the industry of the free laborer was quite as productive as that of the serf. At all events, serfdom died out in England without any special enactment; yet it was not wholly extinct in the latter half of the 16th c., for we find a commission issued 1574, by Queen Elizabeth, to inquire into the lands and goods of all her bondsmen and bondswomen in the counties of Cornwall, Devon, Somerset, and Gloucester, in order to compound with them for their manumission, that they might hold all their lands and goods as freedmen. In a few rare instances, liability to servile duties and payments in respect of lands seem to have continued till the reign of Charles I. In Scotland, as in England, serfdom disappeared by insensible degrees; but a remarkable form of it survived till the closing years of the 18th c.: colliers and salters were bound by the law, independent of paction, on entering to a coal-work or salt mine, to perpetual service there; and in case of sale or alienation of the ground on which the works were situated, the right to their services passed without any express grant to the purchaser. The sons of the collier and salter could follow no occupation but that of their father, and were not at liberty to seek for employment anywhere else than in the mines to which they had been attached by birth. Statutes 15 Geo. III. c. 28, and 39 Geo. III. c. 56, restored these classes of workmen to the rights of freemen and citizens, and abolished the last remnant of slavery in the British Islands.

In France, though a general edict of Louis X., 1315, purported to enfranchise the serfs on the royal domain on payment of a composition, this measure seems never to have been carried into effect, and a limited sort of villeinage continued in some places down till the Revolution. In some estates in Champagne and Nivernais, the villeins, known as *gens de main morte*, were not allowed to leave their habitations, and might have been followed by their lords into any part of France for the *taille* or villein-tax. In Italy, one great cause of the decline of villeinage was the necessity under which the cities and petty states found themselves to employ the peasant population for their defense, whom it became expedient to reward with enfranchisement. In the 11th and 12th c., the number of serfs began to decrease, and villeinage seems no longer to have had an existence in Italy in the 15th c. Over a large portion of Germany, the mass of the peasants had acquired their freedom before the end of the 13th c., but in some parts of the Prussian dominions a modified villeinage continued until swept away by the reforms of Von Stein in the 19th c.

In Russia, where the feudal system never prevailed, the

early condition of the peasant was not servile. Till the 11th c., he could occupy any portion of the soil that he had the means of cultivating, the land being the property of all, and farmed on the purest communistic principles. The reduction of the peasantry to a state of serfdom, and their attachment to the soil, was gradually effected, and not completed till the close of the 16th c. The Russian peasant of the 19th c. was in some respects in as servile a condition as the feudal villein of the 12th c. in w. Europe; but this peculiarity attached to his position, that, while he himself was the property of his lord, the land which he cultivated belonged to himself—a consideration which greatly complicated the question of his emancipation. Emperor Alexander I. introduced various improvements in the condition of the peasantry, particularly those belonging to the crown, and in his reign serfdom was abolished in Courland and Livonia. The entire abolition of villeinage was effected by Alexander II., by a very sweeping measure: from 1863, Mar., the peasants, both husbandmen and domestics, have been made entirely free as regards their persons, while they have also obtained the perpetual usufruct of their cottages and gardens, and certain portions of land.—See SLAVERY.—On serfdom generally, see Hallam's *State of Europe during the Middle Ages*, chap. 2.

SERGE, n *sêrj* [F. *serge*—from L. *sērĭca*, silks—from *Sērēs*, the Chinese]: twilled worsted cloth of inferior quality; a thin woolen fabric. Silk serge is a coarse twilled silk, used for lining men's coats.

SERGE, or CERGE: see SERGES.

SERGEANT, *sâr'jĕnt*, JOHN: missionary: 1710–1743, July 27; b. Newark, N. J.; grandson of Jonathan S., one of the founders of Newark (1667). S. graduated at Yale 1729, and was tutor there 1731–35. In 1734 he began preaching to the Indians of w. Mass., and 1735 settled among them, and preached and taught them in their own language. When in 1736 the Mass. general court bought of the Indians their land in that region, giving to them the township of what is now Stockbridge, S. was given a sixtieth part of it, and was made permanent missionary at Stockbridge and at Kaunaumeek. He founded a school of manual labor at Stockbridge, which was continued several years after his death. He translated into the Indian language portions of the Old Test., and all of the New Test. except the book of the Revelation. In 1743 he published a *Letter on the Indians* and *A Sermon*. He died at Stockbridge.

SER'GEANT, JOHN, LL.D.: lawyer: 1779, Dec. 5—1852, Nov. 25; b. Philadelphia; son of Jonathan Dickinson S. He graduated from Princeton College 1795, studied law, began practice at Philadelphia 1799, and rose to the front rank in his profession. He became commissioner of bankruptcy 1801; was a member of the state legislature 1808–10, and of congress 1815–23; and was one of the prominent advocates of the Missouri Compromise measure 1820; was an envoy to the Panama Congress 1826 member of congress

1827–29; presided over the constitutional convention of Penn. 1830; was candidate of the whig party for vice-president 1832; and was again in congress 1837–42. He was appointed minister to England 1841, but declined to serve, and was afterward referee in a controversy involving a portion of the boundary between N. J. and Del. He died at Philadelphia.

SER'GEANT, JONATHAN DICKINSON: lawyer: 1746–1793, Oct. 8; b. Newark, N. J.; grandson of Jonathan Dickinson S., first pres. of Princeton. After graduating at Princeton 1762, S. studied law and practiced in N. J. In 1776 he became a member of the continental congress, taking his seat a few days after the signing of the Declaration of Independence; but during the year removed to Penn., where in July he became atty.gen. of the state. He resigned 1780, and resumed the practice of law in Philadelphia, and became prominent as counsel in many important cases, among them the settlement with Conn. of the Wyoming land troubles 1782. At the breaking out of the yellow fever in Philadelphia 1793, he was appointed one of the health committee, and devoted himself to relief of the sick, until he was taken with the fever of which he died.

SERGEANT, or SERJEANT, n. *sâr'jĕnt* or *sĕr'jĕnt* [F. *sergent;* OF. *serjant, sergant,* a beadle, an officer of court —from mid. L. *serviens* or *servien'tem,* a sergeant—from L. *servīrĕ,* to serve; *servus,* a servant: It. *sergente,* a sergeant, a beadle]: police-officer of superior rank: in the *army,* non-commissioned officer (see below): in *Eng.,* until lately, a lawyer of the highest rank, called a *serjeant-at-law* (see below): title given to certain of the king's servants, as *serjeant-surgeon.* (For the differing usage in spelling, see the *Note,* at end.) SER'GEANTSHIP, n. the office of a sergeant. SERGEANT-MAJOR, non-commissioned officer who assists the adjutant (see SERGEANT, below). COLOR-SERGEANTS, non-commissioned officers (see SERGEANT, below). KING'S or QUEEN'S SERJEANT, one of the serjeants-at-law who conducts the public causes of the king (see SERJEANT-AT-LAW). COMMON SERJEANT, in *London,* an officer who attends the lord mayor and the aldermen on court-days, etc. SERGEANT-AT-ARMS, officer who preserves order, apprehends offenders, etc. (see SERGEANT-AT-ARMS.) *Note.*—SERJEANT, under the influence of the French *sergent,* is now commonly spelled SERGEANT; both spellings are legitimate, though in the legal sense SERJEANT is always retained.

SERGEANT, or SERJEANT, *sâr'jĕnt* or *sĕr-:* non-commissioned officer of the army and marines, in the grade next above corporal. Sergeants are selected from the steadiest among the corporals, and their duties are to overlook the soldiers in barracks, and to assist the officers in all ways in the field. They also command small bodies of men as guards, escorts, etc. They vary in number and titles: in some arrangements every company has four sergeants, of whom the senior is the *color-sergeant,* and a superior class are the *staff-sergeants,* as the *quartermaster-sergeant, com-*

missary-sergeant, ordnance-sergeant, hospital sergeant; and above them all is the *sergeant-major.* For privileges of a S., see NON-COMMISSIONED OFFICERS. In ancient times, the rank of S. was considerably more exalted. In the 12th c., the sergeants were gentlemen of less than knightly rank (esquires), serving on horseback. Later, the sergeants-at-arms were the royal body-guard composed of gentlemen armed *cap-à-pie.*

SERGEANT-AT-ARMS: in the U. S. senate, U. S. house of representatives, and in state legislatures, officer whose duty it is to preserve order, under the direction of the presiding officer, to expel disturbers of order, to arrest and bring before the bar of the senate or house members absent without leave; and to discharge like functions. In addition, the S.-at-A. of the U. S. house of representatives has charge of the financial accounts of the house with its members.—In the Eng. court of chancery, the S.-at-A. is the officer attendant on the lord chancellor, and executing writs of process, etc.

SERGEANTY, *sär'jĕnt-ĭ* or *sĕr-*, GRAND; also, GRAND SERJEANTY or SERGEANTRY or SERJEANTRY: tenure by which lands were held in feudal times in England. After the Conquest, the forfeited lands were parcelled out by William to his adherents on condition of military services. The military tenants of the crown were of two classes: some held merely *per servicium militare,* by knight-service; others held *per sergentiam,* by grand sergeanty—a higher tenure, which involved attendance on the king not merely in war, but in his court at the three festivals of the year, and at other times when summoned. Although the word baron, in its more extended sense, was applied to both classes of crown tenants, yet it was only those holding by grand sergeanty whose tenure was said to be *per baroniam.* In its earliest stage, the distinction between the greater nobility and lesser nobility or gentry in England was, that the former held by grand sergeanty, and the latter by knight-service only. In theory, lands held by sergeanty could not be alienated or divided; but practically this came to be often done, and thus tenures by sergeanty became gradually extinct before the abolition of military holdings. Considerable misapprehension by Dugdale and later writers has arisen from a double use of the word *serviens,* or sergeant, as applied sometimes to a tenant either by grand sergeanty or knight-service who had not taken on himself the obligations attendant on knighthood.

The term petty sergeanty was applied to a species of socage tenure in which the services stipulated for bore some relation to war, but were not required to be executed personally by the tenant, or to be performed to the person of the king; e.g., payment of rent in spurs or arrows.

SERGES, n. *sĕr-jĕz* [F. *cierge;* L. *cēreus,* a wax-taper—from *cēra,* wax]: in *Rom. Cath. Chh.,* the great wax-candles burned before the altars.

SERGHIEVSKIY POSAD, *sĕr-ghē-ĕv'skē-ē po-sâd'*, or TROITZE-SERGHIÉVSK, *troyts'ā-sĕr-ghē-ĕvsk':* town in Russia, 44 m. n.e. from Moscow. It is in a beautiful country with wooded hills and valleys; and is famous for the Troitsk monastery, on the site of a church erected 1337, which became the center of the ecclesiastical province of Moscow 1561, and is still regarded as the most sacred place in all that region. Its walls range in height from 25 to 50 ft., and are fortified by 9 towers, in one of which is a prison. Within its precincts are a hospital, a theol. acad., nine churches, and two cathedrals. Of the latter, one was built 1422, the other 1585. One of the churches has a tower 290 ft. high and a bell weighing 137½ tons. In the large room under this church about 200,000 dinners are annually given to pilgrims. In the town and its suburbs are a school for girls, an infirmary for aged women, several schools of low grade, and a large number of inns. The principal industry is the manufacture of carved toys, and carved and painted holy pictures, of which great quantities are sold to pilgrims. Pop., including suburbs, 32,000.

SERGIPE, *sār-zhē'pā:* maritime province of Brazil, bounded n. by the São Francisco river, which separates it from Alagoas; w. and s. by Bahia; e. by the Atlantic. According to the most recent statements, this province is the smallest in the republic; 15,000 sq.m. The shores are low and sandy, the interior mountainous. The e. part is fertile, well wooded, and produces sugar and tobacco; in the w., cattle are reared. The chief town is Sergipe del Rey, at the mouth of the chief river—the Vasa Barris.—Pop. of province, about 235,000.

SERIAL, SERIATE, SERIATIM. See under SERIES.

SERICEOUS, a. *sĕ-rĭsh'ŭs* [L. *sērĭcus,* silken—from *Sērēs,* a people of eastern Asia, the Chinese]: in *bot.,* covered with fine close-pressed hairs; silky.

SERICIN, n. *sĕr'ĭ-sĭn* [*L. sērĭcum,* silk]: in *chem.,* a name proposed for the fibroin of silk to distinguish it from the organic matter of the sponge, for which the name fibroin would be retained.

SERICULTURE, n. *sĕr'ĭ-kŭl-tūr,* or *-chûr* [L. *sērĭcum,* silk; *Sērēs,* an old name of the Chinese—as silk first came from the East; L. *cultūra,* culture]: the breeding and treatment of silk-worms.

SEPIE'MA, or SARIA'MA. See CARIAMA

SERIES, n. *sē'rēz* [L. *serĭēs,* a succession, a series—from *serĕrĕ,* to join or bind together: It. *serie:* F. *série*]: a succession of things in the same order, and having the same mutual relation; course; train; in *arith.* or *alg.,* a number of terms in succession, increasing or diminishing according to a certain law. (See SERIES, MATHEMATICAL.) SERIAL, n. *-rĭ-ăl,* some light subject or

subjects commenced and continued in successive numbers of a periodical work; a work appearing in a series or succession of parts; a periodical: ADJ. consisting of a series. SE'RIALLY, ad. *-lĭ*, in a series or regular order. SE'RIATE, a. *-āt*, arranged in or pertaining to a series. SE'RIATELY, ad. *-lĭ*, in a regular series. SE'RIA'TIM, ad. *-ā-tĭm* [L.]: in regular order.

SE'RIES, CHEMICAL: group of compounds each of which contains the same radical. Thus the hydrocarbon Methane, CH_4, may take up any number of molecules of the radical CH_2, giving rise to C_2H_6 (Ethane), C_3H_8 (Propane), C_4H_{10} (Quartane), C_5H_{12} (Pentane), etc. See HOMOLOGY, BOILING OF LIQUIDS.

SERIES: in Mathematics, any sequence of numbers or algebraic quantities. Usually these are to be added together; the series is then a *summation* series, and the numbers are its *terms*. If the number of terms is finite, the series has a definite sum, which can frequently be found in compact form. (See PROGRESSIONS.) But an infinite series often has no sum, i.e., as more and more terms are added on, no definite limit is approached, the sum either increasing without limit or oscillating more or less irregularly. A series which has a sum is said to be convergent. All other series are called divergent. Only convergent series are commonly employed in mathematics. A common test for convergence depends on the ratio of each term to the preceding one. If the numerical value of this ratio becomes and remains smaller than a number less than unity as we pass along the series, the latter is convergent. Thus for the series

$$1+x+x^2+x^3+x^4+x^5 + \ldots$$

this ratio is x; the series is therefore convergent if x is less than 1, and in fact its value is then $1/(1-x)$. But the series is divergent if $x=1$ or is >1. Again the series

$$x-\tfrac{1}{2}x^2+\tfrac{1}{3}x^3-\tfrac{1}{4}x^4+ \ldots$$

is convergent if x is <1 or $=-1$, but is divergent for all other values of x. Another convenient test is applicable to series with alternately positive and negative terms. Such series are convergent if after a certain point the terms constantly decrease in numerical value and approach the limit, 0. Thus the series

$$1-\tfrac{1}{2}+\tfrac{1}{3}-\tfrac{1}{4}+\tfrac{1}{5}- \ldots$$

is convergent; but the series

$$1+\tfrac{1}{2}+\tfrac{1}{3}+\tfrac{1}{4}+\tfrac{1}{5}+ \ldots$$

is divergent. Convergent series that become divergent, like the above, when all the terms are made positive have the curious property that their sum is different according to the order in which the terms are added.

Familiar series in Mathematics are

$$\sin x = x - \frac{x^3}{3^1} + \frac{x^5}{5^1} - \frac{x^7}{7^1} + \ldots$$

$$\cos x = 1 - \frac{x^2}{2^1} + \frac{x^4}{4^1} - \frac{x^6}{6^1} + \ldots$$

$$e^x = 1 + x + \frac{x^2}{2^1} + \frac{x^4}{4^1} + \ldots$$

all of which are convergent for all values of x.

Series arranged in powers of a number or letter are called power series. Fourier series, which are of great value in treating periodical phenomena, such as tides, barometric changes, etc., are arranged in sines or cosines of multiple angles, e.g.,

$$\sin x - \tfrac{1}{3} \sin 3x + \tfrac{1}{5} \sin 5x - \ldots$$

Series are extensively treated in the textbooks on Algebra and the Calculus. See also Osgood, *Introduction to Infinite Series* (Cambridge, Mass., 1902).

SERINAGUR, *sĕr-ĭ-na-gėr'*, or SIRINUGGUR, *sēr-ĭ-nŭg-gėr'*, or CASHMERE, *kăsh-mēr'*, or KASHMIR: city, capital of the Vale of Cashmere; on both sides of the Jhelum, here 100 yards wide; 170 m. n.n.e. of Lahore. It is quaint and picturesque-looking almost beyond conception. The streets, or rather narrow lanes, lead to the river, and the houses, five and six stories high, are built of wood. Not one straight line is to be seen. The houses overhang the river, and lean toward each other above the lanes or the canals, in various stages of dilapidation. Communication between the two quarters is kept up by means of a number of rustic wooden bridges, built on enormous piles of timber or stone. Shawls are an important article of manufacture. Manufacture of articles of papier-maché, whose designs are far in advance of the workmanship, and engraving on stone and metal, are important industries. The vicinity of the city, with its border of towering mountains, is exceedingly beautiful. The numerous lakes, connected with the town and river by canals, recall Venice to the traveller. The most notable public structures are the Jumna Musjid or 'Great Mosque,' capable, according to native estimate, of containing 60,000 persons, the mosque of Shah Hamedan, a royal tomb, and the governor's residence. Near the east end of the city lies the Dal or Lake of Serinagur, about 5 m. long and 2½ broad. It is a lovely and tranquil sheet of water, formerly a choice retreat of the Mogul emperors, the remains of whose pleasure-grounds and palaces are still visible on its margin, the most celebrated being the Shalimar, of polished black marble.—Pop. (1901) estimated 122,618, of whom nearly 40,000 were Hindus: in the early part of the 19th century, it is stated to have been 150,000 to 200,000.

SERINGAPATAM, *sĕr-ĭng-ga-pa-tăm'* (properly, *Shri Ranga Patanam*, City of Vishnu): decayed city of south-

ern India, former capital of Maisur or Mysore, on an island in the channel of the Kaveri, 9 m. n.n.e. of Maisur. The island, 3 m. long and 1 broad, has a wretched appearance, and the town itself is ill built, ill ventilated, and ugly. The fort, about three-quarters of a m. broad, is surrounded by strong walls of stone, and contains the palace of Tippoo Sahib. Hyder Ali made it the seat of his govt. 1765. It was besieged by Lord Cornwallis 1791 and 92. On the last occasion, the terms dictated by the commander of the British to Tippoo, son and successor of Hyder Ali, were very severe. A British army appeared before the walls again 1799; and May 3 the fort was stormed, and Tippoo slain near his palace. Pop.—said to have been 300,000—now 12,500

SERIO-, prefix, *sē'rĭ-ō:* having a mixture of serious interest; partly serious.

SERIO-COMIC, a. *sē'rĭ-ō-kŏm'ĭk,* or SE'RIO-COM'ICAL, a. *-ĭ-kăl* [from Eng. *serious,* and *comic:* L. *sērĭō,* in earnest]: combining the serious and sportive.

SERIOUS, a. *sē'rĭ-ŭs* [mid. L. *seriōsus*—from L. *serĭus,* grave, earnest: It. *serioso:* F. *sérieux*]: grave in manner or disposition; deeply impressed with the importance of religion; not light or gay; being earnest; weighty; not trifling. SE'RIOUSLY, ad. *-lĭ,* solemnly; in earnest. SE'RIOUSNESS, n. *-nĕs,* the condition or quality of being serious; gravity of manner or of mind; solemnity; earnest attention.—SYN. of 'serious': grave; solemn; important; weighty; earnest; religious.

SERJEANT. See SERGEANT.

SER'JEANT-AT-ARMS. See SERGEANT-AT-ARMS.

SER'JEANT-AT-LAW, or SERGEANT-AT-LAW: formerly the highest degree of barrister in the common law of England, called serjeant-counter, or of the coif. The degree is of great antiquity; and a barrister could be appointed only after being of 16 years' standing. Formerly, also, these officers had exclusive audience in the court of common pleas. No appointments have been made since 1868, and the order was nearly extinct 1883. Their proper forensic dress was a violet-colored robe with a scarlet hood. The degree was entirely honorary, and merely gave precedence over barristers; forming a separate community. Sometimes one or more of the serjeants-at-law have been appointed queen's serjeants.

SERMON, n. *sĕr'mŏn* [F. *sermon*—from L. *sermo* or *sermōnem,* a speaking discourse: It. *sermone*]: a discourse delivered by a clergyman or licentiate from a pulpit, generally on a text selected from Scripture; a homily; any serious exhortation. SER'MONIZE, v. *-īz,* to inculcate rigid rules; to preach. SER'MONIZING, imp. SER'MONIZED, pp. *-īzd.*

SERON, n. *sĕ-rŏn',* or SEROON, n. *sĕ-rôn'* [F. *serron,* a box containing foreign drugs: Sp. *seron,* a hamper]:

in *commerce*, a bale or package made of hide or leather, or formed of pieces of wood covered or fastened with hide, for holding drugs, etc.; also CEROON.

SEROTINE, n. *sĕr'ō-tĭn* [F. *sérotine*—from L. *serōtĭnus*, that comes late—from *sēro*, late]: a species of bat.

SEROTINOUS, a. *sĕ-rŏt'ĭ-nŭs* [L. *serōtĭnus*, happening late—from *sēro*, late]: in *bot.*, applied to a plant which flowers later in the year than others to which it is related.

SEROUS, a. *sē'rŭs* [F. *séreux;* It. *seroso*, serous—from L. *sĕrum*, whey]: watery; thin; like whey; pertaining to serum. SEROSITY, n. *sĕ-rŏs'ĭ-tĭ*, in *med.*, the watery part of serum when coagulated by heat. SERUM, n. *sē'rŭm* [L.]: the thin watery substance like whey which separates from the blood when coagulated (see BLOOD).

SE'ROUS FLUIDS: term applied to various fluids in the animal body, arranged under four heads: 1. Those contained in the serous sacs of the body, e.g., cerebro-spinal fluid, pericardial fluid, peritoneal fluid, pleural fluid, fluid of the tunica vaginalis testis, and synovial fluid. 2. The tears and the fluids in the eyeball, the amniotic fluid, and transudations into the tissue of organs. 3. Morbid or excessive transudations, e.g., dropsical fluids, the fluids occurring in hydatids, and in blebs and vesicles on the skin. 4. The fluid portion (serum) of the blood and lymph, which is the source of all the serous fluids above enumerated.

All these fluids closely resemble one another in their physical and chemical characters. So far as relates to their physical characters, they are usually clear and transparent, colorless or slightly yellow, of slight saline, mawkish taste, and exhibiting alkaline reaction with test-paper. The ordinary chemical constituents of serous fluids are water, fibrin (occasionally), albumin, and inorganic salts. Rare constituents, and occurring only in disease, are sugar, the biliary acids, salts and lactic and succinic acids, creatinin, mucin, etc. The following analyses of four of the serous fluids will give a good idea of their composition:

	Plasma of the Blood.	Peritoneal Dropsy.	Hydro-thorax.	Dysenteric Transu-dation.
Water	901.51	946.0	936.0	958.6
Solid Constituents	98.49	54.0	64.0	41.4
Fibrin	8.06		0.6	
Albumen }		33.0	52.8	15.0
Extractive Matters }	81.92	13.0	3.0	14.6
Inorganic Salts	8.51	8.0	7.4	11.8

SE'ROUS MEM'BRANES: in anatomy, seven membranous bags—all, except one, closed bags—having their inner surfaces moistened with serum. Three of the serous membranes in the human body are median and single, while two are double and lateral. They are the arachnoid, the pericardium, and the peritoneum, with the two pleuræ and tunicæ vaginales testis. Thus they are connected,

with the obvious view of facilitating motion and affording general protection, with all the most important organs in the body. Each sac or continuous membrane consists of two portions—a parietal one which lines the walls of the cavity, and a visceral or reflected one which forms an almost complete coating or investment for the viscera contained in the cavity (see PERICARDIUM: PERITONEUM: PLEURÆ). In structure, they consist essentially of (1) Epithelium; (2) Basement Membrane; (3) A stratum of areolar or cellular tissue, which constitutes the chief thickness of the membrane. This layer is more liable to variation than the others, and one of the most common alterations is an augmentation of the yellow fibrous element, by which an increased elasticity is given to the membrane, which is thus better adapted for distention, and for subsequent return to its original bulk. The situations in which this augmentation is found are pointed out in exact conformity with this view: in the peritoneum, which lines the anterior abdominal wall, and covers the bladder, it attains its maximum; in the detached folds of the mesentery, in the costal pleuræ, and in the suspensory ligament of the liver, it is still very prominent; while on the posterior wall of the belly, and in serous membranes covering the heart, liver, etc., it is almost absent.

The following are the most important morbid changes to which the serous membranes are liable. One of the most frequent is an excess of serous fluid in their cavity. This condition occurs in various diseases; and in general the serous membrane only shares in a dropsy common to other structures. When general anasarca, or dropsy of the cellular tissue, has long existed, more or less dropsical effusion is usually found in the pleuræ and peritoneum. Concerning inflammation of these structures, see PERICARDITIS; PERITONITIS; PLEURISY. Tubercle is seldom primarily deposited in these membranes, though it is not uncommon after other organs have been implicated. Cancer and ossification of the serous membranes are rare, but cysts of various kinds, some of parasitic origin, are often found.

Synovial membranes present many points of similarity to serous membranes, but with several points of difference.

SER'OW: a shaggy goat-antelope (*Nemorrhœdus bubalinus*) of the Himalayas, where it frequents, singly, or in family parties, the roughest slopes, at an altitude between 6,000 and 12,000 ft. Its habits are similar to those of the goral, Rocky Mountain white goat, and other members of the genus, all of which are called 'serows' by some writers.

SERPENT, n. *sĕr'pĕnt* [F. *serpent*—from L. *serpens* or *serpen'tem*, a serpent—from *serpo*, I creep: It. *serpente*]: reptile having a very long body without feet,

and which moves by undulations and contractions (see SENPENTS: SERPENT-CHARMING): a subtle or malicious person: musical instrument twisted somewhat like a serpent (see below). SERPENT-LIKE, a. acting like a serpent. SERPENT-FISH, a fish of a red color resembling a snake. SERPENT-STONES, SERPENT'S-TONGUE, popular names of certain fossil shells or teeth, the latter also the plant *adder's-tongue*. SER'PENTA'RIA, n. *-pĕn-tā'rĭ*-a, or SER'PENTARY, n. *-tĕr-ĭ* [F. *serpentaire*, dragon-wort—from L. *serpentārĭa*]: the Virginian plant *snake-root*—the *Polyg'ăla sen'ĕga*, ord. *Polyg'ălācĕæ;* also the *Aristolōchĭa serpentārĭa*, ord. *Aris'tolochĭācĕæ;* name applied to many plants (see ARISTOLOCHIA). SER'PENTA'RIUS, n. *-rĭ-ŭs*, a northern constellation. SER'PENTRY, n. *-trĭ*, a winding or twisting like that of a serpent. SERPENTIFORM, n. *sĕr-pĕn'tĭ-fawrm* [L. *forma*, shape]: serpent-shaped.

SERPENT: (1) in astronomy, one of the 48 varieties of ancient constellations extending serpent-like through a wide expense of sky. (2) In music, an almost obsolete bass instrument, consisting of a wooden tube, about 8 ft. long, increasing conically from 1 in. diameter at the mouthpiece to 4 in. at the open end, twisted into U-shaped turns, followed by a large circular convolution. This is covered with leather, and has a mouthpiece like a horn or trombone, and keys for the several notes to be produced. The serpent is a transposing instrument, being in B flat, and the part it is to take is therefore written a note higher than its real sound. Its compass is three octaves and one note.

SERPENT-CHARMING: an art largely practiced in Egypt, India, and other eastern lands; there are allusions to it in the Hebrew sacred books, namely, Ps. lviii. 5, the adder which will not hearken to the voice of charmers; Eccles. x. 11, and Jere. viii. 17; also in some of the Greek and Latin classics. The power of charming the most formidable serpents, as exercised by the snake-charmers, is unquestionable; nor is it true that before making an exhibition of their art the charmers always extract the poison-fangs of the creature, though that is often done. Dr. Davy, in his *Interior of Ceylon*, expresses his belief in the reality of this singular power. 'I have examined the snakes,' he writes, 'and have found the fangs in and uninjured. These men do possess a charm, though not a supernatural one—namely, that of confidence and courage. . . . They will play their tricks with any hooded snakes (*Naja tripudians*), whether just taken or long in confinement, but with no other kind of poisonous snakes.' The serpent-charmers are sometimes employed to rid gardens of serpents; and they have a power beyond other men of knowing when a serpent is concealed anywhere. In practicing their art for this purpose, as also in their exhibitions, they employ a kind of flute in aid of their incantations. When the serpents issue

from their hiding places the performer secures them by pinning them to the ground with a forked stick.

SERPENT-HEAD, or WALKING-FISH: a fish of the East Indian and African genus *Ophiocephalus*, the type of a family, allied to the climbing perch, and like it able to live a long time out of the water, and to travel by wriggling through moist grass, from one pool to another. The body is elongate, 2 to 3 ft. long, and covered with medium-sized scales, those on the depressed head being platelike. About 30 species are known, inhabiting many parts of Asia, the commonest being *O. striatus*, which is sometimes found torpid in dried-up pools, and irrigation tanks. When living in muddy water they must rise to the surface from time to time to take in air, or they will smother to death. These fishes are eaten throughout the orient.

SERPENTIGENOUS, a. *sėr'pĕn-tĭj'ĕ-nŭs* [L. *serpentĭg'ĕna*, one who is sprung from a serpent—from *serpens* or *serpen'tem*, a serpent; *gigno*, I beget]: bred of a serpent.

SERPENTINE, a. *sėr'pĕn-tīn* [F. *serpentin*, serpentine —from L. *serpens* or *serpen'tem*, a serpent]: resembling a serpent in motion; winding; meandering; spiral; twisted; subtle: N. [F. *serpentine*]: a mineral, chiefly hydrated silicate of magnesia (see below). SER'PENTINELY, ad. *-lĭ*.

SER'PENTINE: hydrous magnesium silicate, is an abundant and widely distributed mineral. Its hardness varies more than that of any other mineral, ranging from 2 in the variety picrolite up to 6 in bowenite. Its specific gravity varies from 2.14 in some chrysotile to 2.80 in some precious serpentine. It often occurs in pseudomorphs, over a dozen of which have been described. Among these the most common are the pseudomorphs after chrysolite, enstatite, amphibole, and pyroxene. Its varieties are mostly based on structure. The massive include precious serpentine, translucent and of rich, dark or pale green color; common serpentine, similar in color, but nearly opaque. The lamellar varieties include antigorite and marmolite. Williamsite, though more massive, is one of the lamellar varieties. It is apple-green and translucent, and is often cut and polished. Chrysotile is fine fibrous, the fibres being easily separable and flexible. Its lustre is silky, color pale green, yellow or brown. It often occurs in veins in massive serpentine. Serpentine rocks occur in masses often of enormous dimensions. They are formed, as indeed are all serpentines, by the alteration (serpentinization) of other minerals, most commonly olivine (peridotyte), pyroxene, or amphibole. They are often more or less mixed with limestone or magnesite, these minerals giving the mass a clouded or veined appearance. Verd antique, or ophicalcite, and many other serpentine rocks are known as serpentine

marbles, and are extensively used in interior decoration. Some of them are very highly prized for their rich green, yellow and brown colors, others are beautifully mottled with red. Many buildings in Philadelphia and other cities are constructed of a green serpentine rock from West Chester, Pa. Among the most noteworthy regions producing serpentine are England, Ireland, Maryland, New Mexico, California, and Washington.

SER'PENTS (*Ophidia*): order of reptiles, in general simply characterized as having a very elongated body and no external limbs. The links, however, which unite saurians with serpents are very numerous; the limbs of many saurians being partially lacking, and little more than rudimentary; while rudimentary limbs are found by anatomical examination in many serpents, and the rudimentary hinder limbs of some, as boas, appear externally in the form of hooks or claws: see BOA.

The body and tail are covered with scales, the head often with plates. The vertebræ and ribs are extremely numerous, a pair of ribs being attached to each vertebræ throughout the length of the body: some serpents have more than 300 pair of ribs. The ribs not only give form to the body, and aid in respiration, but are also organs of locomotion. There is no breast-bone (*sternum*) for the small end of the ribs to be attached to, as in other vertebrate animals, but each rib is joined by a slender cartilage and a set of short muscles to one of the scales of the abdomen. A serpent moves by means of the ribs and of these scales, which take hold on the surface over which it passes: and in this way it can glide—often very rapidly—along the ground, or on the branches of trees; and many species climb trees with great facility, gliding up them as if on level ground. Most—if not all—of the species are also capable of elevating a great portion of the body from the ground; and many of those which live among branches of trees hold their place firmly by means even of a few scales near the tail, and freely extend the greater portion of the body in the air, but in these arboreal species the tail constitutes nearly if not all of two-thirds of the entire length of the animal. On a perfectly smooth surface, as that of glass, a serpent is quite helpless, and has no power of locomotion. The vertebræ are so formed as to admit of great pliancy of the body, which is capable of being coiled up, with the head in the centre of the coil; that some serpents have the power of throwing themselves to some distance from this coiled position is one of the erroneous serpent legends of the past. No serpent can throw itself more than two-thirds of its body length. The vertebræ are articulated by perfect ball-and-socket joints, the anterior extremity of each being rounded into a smooth and polished ball, which fits exactly into a hemispherical cup in the next; but there are processes in each vetebra which prevent any motion except from side to side, so that serpents are

incapable of the vertical undulations so often represented in prints. The ribs are also attached to the vertebræ by ball-and-socket joints.

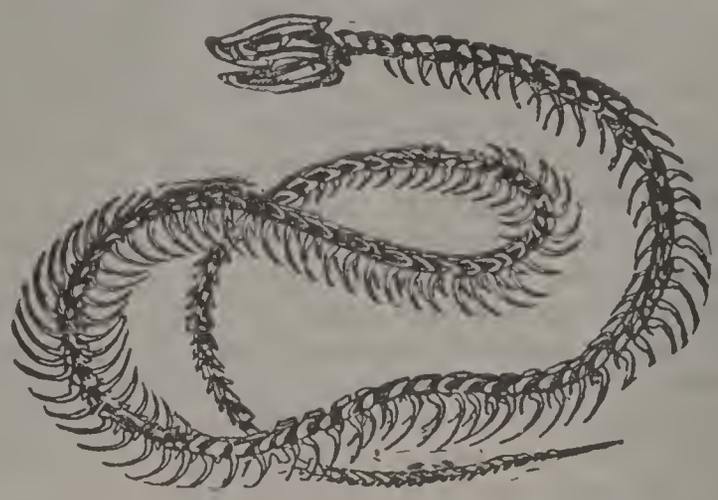


Fig. 1.—Skeleton of the Rattlesnake.

Cuvier divided serpents into three sections, the first—of which the common Blind-worm, or Slow-worm is an example, but now classed with lizards—consisting of those which have the skull, teeth, and tongue similar to those of saurians, and in which the eye has three lids, and there are vestiges of bones of anterior limbs; the second, which Cuvier calls True Serpents, having no vestiges of such bones, the eye destitute of lids, and the bones of the head so formed that the mouth and throat are capable of very great dilation; the third, which he calls Naked Serpents, containing only the genus *Cæcilia,* now known, notwithstanding its form, to belong really to the Batrachians or Amphibia.

The serpents of Cuvier's first section have been conjoined with some of the nearly allied saurians, more or less furnished with external limbs, under the name *Saurophidia,* by Gray. They are connected with the True Serpents by the families *Amphisbænidæ* and *Typhlopsidæ,* which nearly agree with them in structure of the head and mouth, but lack the third eyelid—some of the *Typhlopsidæ,* indeed, having the eye itself merely rudimentary—and, like the True Serpents, have no vestige of breastbone or shoulder. These, with all the creatures included in this section, are, so far as is known, perfectly harmless. They live chiefly on insects and other very small animals. The true serpents are now divided into five sub-orders: the *Solenoglypha,* the *Proteroglypha,* the *Opistoglypha,* the *Asinea* or *Aglyphodontia* and the *Angiostomata;* the latter are mostly small, cylindrical, worm-like serpents, characterized by having a small gape, and the quadrate and squamosal bones being fixed to the skull. Examples: *Typhlops, Tortrix* and *Uropeltis.*—The *Asinea* are characterized by all teeth being solid, the premaxillæ long, the squamosal bones long and movable on the skull, and all facial bones extensile; they include

all non-venomous serpents. They are arranged in eight families and constitute the majority of all serpents.—The *Opistoglypha* are large and small forms, in most of which the hindmost teeth of the upper jaw are grooved. That the members of this division are really venomous was not positively proven for a long time. The order contains six families, distributed throughout the torrid zone and includes, for example, the Indian and South American genera *Scytale, Dipsas* and *Dryophis,* all more or less arboreal in their habits and conformation. The *Proteroglypha* are all those serpents which possess a permanently erect grooved or hollow fang on the anterior part of the upper jaw bone, solid teeth behind and on the palatines, pterygoids and mandioles. The head is covered with shields and not well defined from the body. There are but two families: the *Hydrophidæ* or true sea-water serpents and the *Elapidæ,* of which the American *Harlequin* serpent and the Indian *Cobra* are examples.—The sixth sub-order, the *Solenoglypha,* comprises all other venomous serpents. The head is triangular and sharply defined from the neck, the upper maxillary bones are short and in the *Crotalidæ* hollow, with few fang-like tubular teeth. When the serpent opens its jaws the lower end of the quadrate bone is advanced, the pterygoid is pushed forward, the maxilla is rotated and the fangs erected. They are divided into two families, the *Crotalidæ* and the *Viperidæ.*

The True Serpents live on larger prey, which they swallow entire, some of them—as the boas—crushing it by constriction in the coil of their muscular body. The prey of a serpent is often thicker than the serpent itself; and to admit of its being swallowed, the throat and body are very dilatable. The bones of the head are adapted to the necessity of great expansion of the mouth and dilation of the throat, as will be seen by the annexed figure of the distended jaws of the rattlesnake. The bones composing the upper jaw are loosely joined together by ligaments; and even the arches of the palate are movable. The two halves of the lower jaw are connected by a ligament, so loose and elastic that they are capable of separation to a great extent; and the mastoid and tympanic bones, which connect the lower jaw and the skull, are lengthened out into pedicles, allowing extraordinary dilation. The teeth of the True Serpent are simple, and directed backward. In the non-venomous kinds there are

Fig. 2.

four rows on the upper part of the mouth—two rows on the jaws, and two on the palate; each division of the lower jaw also is armed with a single row. In vipers, rattlesnakes, and other venomous serpents, there are no teeth on the upper jaw, except the poison-fangs; the palatal teeth, however, forming two rows as in the non-venomous kinds, the arrangement of teeth in the lower jaw being also the same. Venomous serpents do not, in fact, need the same array of teeth as the non-venomous; depending rather on the power of their venom for their prey, which they suddenly wound, and then wait till it is dead. The poison-fangs are long in comparison with the other teeth; they are two in number, firmly fixed into a movable bone; when not in use, they are laid flat on the roof of the mouth, covered by a kind of sheath formed by the mucous membrane of the palate; when the animal is irritated, and about to assail its enemy or its prey, they stand out like two lancets from the upper jaw: they move with the bone into which they are fixed; and the bone and muscles are so arranged that the opening of the mouth brings them into position for use. There is above them, and toward the back of the head, a large gland for elaboration of the poison, which is forced through them by the action of the muscles, each fang being tubular. The tube of the fang is formed not as by a hollowing of it, but as by a bending of it upon itself, and is situated in front: the opening near the fang's point is a narrow longitudinal fissure. The poison-fangs are very liable to be destroyed, and new ones in different stages of development are generally found behind them, ready to grow and supply their place. It is sometimes stated as a distinction between venomous and non-venomous serpents, that the former have only two rows of teeth on the upper part of the mouth, while the latter have four. This rule must not, however, be accepted without qualification. In the marine serpents (*Hydrophidæ*), there are rows of maxillary teeth behind the poison fangs; and some of the venomous land serpents, as the *Bongars* or *Rock Snakes* of the East Indies, which, however, are not among the most venomous, have some smaller teeth in the jaw-bones behind the poison-fangs. The venom itself is but a modification of the saliva in other animals, and certainly proves a most powerful digestive agent by causing rapid disintegration of the animal substances. The color of the poison varies from very pale to deep yellow. Exposed to the air it dries rapidly, and on glass has the appearance of varnish, but, unlike it or any other similar liquid, cracking in a very characteristic manner. In dessicated form, or mixed with alcohol or glycerin, it will retain its vitality indefinitely without losing any of its strength. If fresh venom be allowed to stand undisturbed in a vial for some time, it becomes cloudy and finally a sediment will form at the bottom, consisting of epithelial cells, red and white cor-

puscles and micrococci. Introduced into an animal these solid parts produce no effect, but the clear liquid continues to act as if it had not been separated from the former substances. Venom is really a compound, consisting of several proteids, either of which is sufficient to produce death, acting differently, however, upon the system. The percentage of the proteids in the compound is different, not only in different species, but in individuals. This, of course, explains the reason why the successive symptoms as well as the attending results are subject to such great variation. Moreover, the influence of the venom upon the system is so exceedingly rapid and powerful, and manifests itself in such different ways, that it appears almost beyond our power to combat with certainty in all cases its inroads. The venom introduced into a warm-blooded animal may induce death through several affections. It may occur through paralysis of the heart muscle, through hemorrhages of the medulla, through the thoroughly altered condition of the red blood cells, which by losing their bi-concave form, are prevented from oxygenating the vital fluid, and lastly and generally through paralysis of the respiratory nerve-centers. The action of the venom upon the natural prey of the serpent is extremely rapid, death occurring almost instantaneously—a squeak, a few tremors and life is extinct. Of course, in the case of larger animals or man the action of the venom may be slower and death may not supervene until after the elapse of an hour or more.

The treatment of serpent-bite hardly falls within the precincts of this article, but a few suggestions may not be amiss. Localize the venom by ligation as closely as possible behind the wound, incise the wound freely and minimize the venom by either sucking or cupping of the blood. Next give attention to the patient's condition, should there be any signs of diminished heart-activity stimulate with small doses of alcohol or ammonia. Never give either of the two while the heart is doing overtime by the action of the venom. If the serpent was either a Rattlesnake, Copperhead or Watermoccasin, or, in fact, any of the pit-vipers, inject two or three drops of a 1:100 solution of chromic acid into the incised wound and surrounding tissue. This should be done as quickly as possible to neutralize the venom before it can be absorbed into the general circulation. In the absence of chromic acid, permanganate of potash or gold-chlorid may be substituted. Loosen now the ligature to admit a fresh supply of blood and to prevent mortification of the wounded parts. The systematic treatment should now be begun by a physician, and the most reliable agent in this treatment is undoubtedly a poison fully as deadly as the venom itself: strychnin. Liquid strychniæ should be hypodermically injected in 15 to

20 minim doses every twenty minutes until slight tetanic spasms manifest themselves.

The tongue of serpents is forked, ending in two exceedingly fine, hairlike and soft points, which are the seat of exquisitely sensitive nerve-endorgans. The sense of touch is, undoubtedly, the highest developed and compensates for the apparent lack of taste. Actual touch does not seem to be necessary, sensation being carried to the distance of several inches. The tongue is erroneously regarded as the sting, but serpents have no sting, and the only weapon they possess are the fangs already noted. The only sound which they emit is hissing and this is accomplished by the forced expulsion of air over the protruded ends of the tongue. The rattle of the rattlesnakes is caused by the rapid shaking of the remnants of cast skins on the end of the tail. This characteristic performance without the skin-remnants is imitated by nearly all other serpents, venomous or harmless, of the Western Hemisphere.

The larynx consists of two longitudinal strips of cartilage joined together by a variable number of cross bands and has a single ring-like opening; there is but a single arytenoid cartilage and no epiglottis. The trachea is composed of complete rings and ends in two bronchi which open directly into the sacculated lungs. The lungs are unequally developed; the left lobe is usually atrophied and the right exceedingly elongated, conforming itself to the narrow body cavity. The only exceptions in this respect are the Pythonidæ and Boidæ, where the lungs are subequal. The heart is imperfectly four chambered; the right auriculo-ventricular opening has two valves and the coronary artery springs from the right arch. The liver has sometimes one, sometimes two lobes; the gall bladder is some distance from the liver and opens directly into the duodenum. The right kidney, as well as testicle or ovary, lies in front of the left. The copulatory organs are paired, the penes are eversible and furnished with horny spines. Serpents are either strictly oviparous or ovo-viviparous. The majority of the non-venomous are oviparous; the eggs, from twenty to forty, are deposited in moist places under decaying vegetation where the heat evolved in the process of decomposition is sufficient to insure the development of the embryo, which is usually accomplished in from five to six weeks. The egg shell is tough and parchment-like but not entirely devoid of calcareous substances. The young serpent is furnished with a sharp, pointed, premaxillary egg-tooth with which it rips an opening into the shell. The egg-tooth is lost soon after the young serpent has escaped. The mother serpents do not concern themselves about their eggs or progeny with the exception of some species of Python, which coil themselves around the egg-mass and incubate them until the young are hatched. The majority, if not all of the venomous

serpents, as well as a large number of the *Colubridæ* are ovo-viviparous. The embryos are fully developed when the membranous eggs are laid and immediately proceed to cut their way to freedom. The process of hatching may also take place before the eggs are laid, the young issuing at once from the mother. The period of gestation in all ovo-viviparous serpents is twenty-two weeks.

It has been often alleged that vipers and other serpents, when alarmed, swallow their young, and eject them again after reaching a place of safety. There still remains some doubt on this curious question, which has been much discussed; and it is probable that the alleged proofs of it from living young ones issuing out of the body of the parent when crushed are to be accounted for by ovo-viviparous mode of generation.

It seems probable that serpents do not possess the senses of taste or smell in great perfection. The ear has no external opening and no tympanum, nor is it certain that their hearing is acute, but they are remarkably sensible of the power of music, of which serpent-charmers avail themselves, both to bring them from their holes and to control them. The eyes of serpents are, as a rule, small in comparison with the size of body, although most of the *Colubridæ* show remarkable alertness bordering on intelligence in their visual organs. The pupils of all non-venomous and opistoglyph and proteroglyph venomous serpents are round, whereas, the pupils of all venomous serpents belonging to the *Solenoglypha* and the Pythons and Boas are elongated and capable of dilation and contraction. This construction of the visual organ is, of course, in conformity with the life-habits of the animals. Besides the usual construction of the corneal membranes the eyes of serpents are protected by the continuation of the general integument or skin over them. The skin is usually cast four or five times a year and is always thrown off by reversing it so that the scales appear concave in the exuviæ. If the animal is in perfect health the skin comes off entire and without a break in it. Several days before the old skin is shed the colors of the animal are dull and opaque, the animal itself is listless and abstains from food. Two or three days before shedding also, that part of the skin which passes over the eyes becomes milky in appearance, and the serpent is erroneously believed to be blind. The process of shedding begins at the lips; by rubbing the sides of the head against stones or roots the skin around the lips becomes free and turns backward, and when now the animal crawls between and through the dense herbage and low underbrush, the skin adheres to them by the viscid fluid which is always secreted between the old and new integument. The animal now comes forth in clearer and brighter colors, which are various and often very beautiful but always more or less in protective harmony with the natural haunts of the

animal. As a rule, but not without exceptions, the venomous species and, especially, the *Solenoglypha* are of darker and more uniform colors, indicating again their night-prowling habits.

The aversion and horror with which serpents are so generally regarded are due more to traditions or exaggerated accounts of popular errors and superstitions than to the dangerous character of the serpents. The minority of venomous species are used as food by some savage tribes. They are capable of being tamed and even venomous ones, as copper-heads and sand-vipers, have been trained to receive their food and drink from the hands of their keepers without their ever showing any disposition of aggressiveness. Non-venomous serpents, especially Boas, are frequently kept in houses in Brazil and are found useful in killing mice and rats. Serpents abound chiefly in tropical climates, though some are found in northern countries, as in Scandinavia. See SNAKE.—See Huxley's *Comparative Anatomy of Vertebrated Animals; Riverside Natural History;* Cassell's *Natural History;* Fayrer's *Thanatophidia of India,* and *Brit. Museum Catalogue of Snakes.*

SERPENT-WORSHIP, or OPHIOLATRY: a primitive form of religion which is still found existing among uncultured races. The serpent's change of skin may well have been suggestive of resurrection and immortality; the more common supposition that the serpent was regarded by his savage worshippers as the personification of evil and of maleficence, and as a power to be appeased by gifts and worship, does not appear to be justified by the reports of travelers, though the Apophis-serpent of the Egyptian Hades, as well as the wicked Aji Dahaka of the Zoroastrians were undoubtedly worshipped purely through fear. The brazen serpent erected by Moses in the wilderness and afterward preserved till the days of Hezekiah was broken in pieces by that king (2 Kings xviii. 4), the image having been made an object of religious worship; this was apparently a recrudescence of primitive serpent-worship among the people of Judah: the brazen serpent, it is conjectured by Renan (*Hist. Peuple d'Israel* I. xi.), was a primitive idol of Jahve. We see a trace, and more than a trace, of a primitive worship of the serpent in the great serpent which guarded the citadel of Athens and which was fed every month with honey-cakes; also in the embassage from Rome on the occasion of a plague, to the temple of Æsculapius at Epidaurus, whence was brought a living serpent which was received at Rome with great ceremony. Serpent-worship is still extensively practiced in India. Among no people has the mystery of serpent worship weighed more than on the aborigines of America. It has given name to rivers, examples, Kennebec and Antietam: the name for *spirit* and *snake* are one among the Dakotas, the Shawnees and the Sacs. The Ojibways dread to kill a

rattlesnake, and if they find one in their path they pray it to go away and spare them and their families. In Mexico sculptured images of serpents are found as large and as carefully wrought as those of India.

SERPIGO, n. *sėr-pī'gō* [L. *serpĕrĕ,* to creep]: in *med.,* ringworm or tetter, so called from its creeping over the surface of the skin. SERPIG'INOUS, a. *-pĭj'ĭ-nŭs,* affected with serpigo.

SERPUKOV, *sĕr-pô-ċhov',* or SERPUKHOFF, *sĕr-pô-khof':* very ancient Russian town, 61 m. s. of Moscow, on high cliffs, on the banks of the Nara, 3 m. above its confluence with the Oka. It contains a cathedral, and is defended by a Kreml, or citadel. There are more than 50 factories, of which those engaged in manufacture of cotton prints, sail-cloth, woolen goods, and leather are of importance. Pop. 25,000.

SERPULA, n. *sėr'pū-lă,* SER'PULÆ, n. plu. *-pū-lē* [L. *serpŭla,* a little serpent—from *serpĕrĕ,* to creep]: genus of annelids, of the order *Tubicolæ;* named from the tortuous and twisted tubes which they form and inhabit. The tube is calcareous, like that of mollusks, and was therefore described in old works on conchology. Indeed, the shell of a serpula is not always easily distinguished from that of mollusks of the genus *Vermetus,* though the inhabitants are extremely different; but the shell of *Vermetus* has a regular spire at the apex, not found in that of any serpula. The serpulæ attach their shells to rocks, shells, etc., in the sea. The shell is variously contorted, and some species live in groups, with the shells intertwined. The wider end of the shell is open, and from it the animal protrudes its head and gills, which expand as beautiful fan-like tufts. They are in general exquisitely colored, and are among the most interesting and beautiful creatures for an aquarium. On the slightest alarm, they disappear completely into the tube, which then is closed by an operculum curiously framed as an appendage to the gills. The species are numerous in all parts of the world; but the largest are found in tropical seas, and are among the lovely objects visible through clear, still water on coral reefs. SERPULIDÆ, n. plu. *sėr-pū'lĭ-dē,* or SERPU'LIDANS, n. plu. *-dănz,* animals of the genus Serpula. SERPULITES, n. plu. *sėr'pū-līts* [L. *serpŭla,* a little serpent; Gr. *lithos,* a stone]: in *geol.,* the general term for all fossil tortuous tubes and tube-like organisms, apparently allied to those of the existing Serpulæ, and possibly the products of tube-forming annelids.

SERRANO Y DOMINGUEZ, *sĕr-râ'no ē thomēn'gĕth,* FRANCISCO, Duke de la Torre: marshal of Spain: 1810, Sep. 17—1885, Nov. 26; b. Arjouilla, Andalusia; son of Gen. Serrano y Cuenca. When 16 years of age he entered the army; he was rapidly promoted, and was made a gen. 1840. He was largely instrumental in the over-

throw of Espartero 1843; was promoted lieut.gen. 1845, and soon afterward entered the senate and was appointed minister of war. He had great influence over Queen Isabella, and 1846 caused a bitter quarrel in the royal household, which resulted in the overthrow of the ministry. He became a liberal and joined his former enemies; was banished 1854 for his connection with an insurrection at Saragossa; but soon returned and was appointed capt.gen. of New Castle; was ambassador to Paris 1857; was capt.gen. of Cuba 1860, and for his services there was made 1864 a grandee and given the title Duke de la Torre. He was president of the senate 1866; joined in the revolution 1868, and became commander-in-chief of the army; was regent of Spain 1869, June 16—1870, Nov. 16; became president of the republic 1874, Feb. 27; but the following Dec., on learning of the movement to proclaim Alfonso king, he retired to France. In 1875 he was again in the senate of Spain, and 1883 became minister to France. He died at Paris.

SERRATE, a. *sĕr'rāt,* or SER'RATED, a. *-ĕd* [L. *serrātus,* saw-shaped—from *serra,* a saw]: in *bot.,* notched on the edge like a saw, as a leaf: where the teeth are themselves serrate, the term used is BI-SERRATE, which see. SERRATION, n. *sĕr-rā'shŭn,* notching resembling a saw. SERRATURE, n. *sĕr'rā-tūr,* a. saw-like notching on the edge of anything. SER'RULATE, a. *-rū-lāt,* or SER'RULATED, a. *-ĕd* [L. *ser'rŭla,* a little saw]: in *bot.,* the same as SERRATE; having very minute notches; having very fine serratures. SER'RULA'TION, n. *-lā'shŭn,* the state of being notched minutely like the teeth of a fine saw.

SERRE-FILE, n. *sėr-fĭl'* [F. *serre-file,* a bringer-up—from *serrer,* to tighten—from L. *sera,* a bolt; F. *file,* a file—from L. *filum,* a thread]: in *mil.,* a bringer-up—a squadron or troop *serra-file* being an officer or non-commissioned officer in rear of the centre of the squadron or troop.

SERRIED, a. *sĕr'rĭd* [F. *serré,* closely pressed; *serrer,* to shut in, to press—from mid. L. *serārĕ,* to lock—from L. *sera,* a bolt]: crowded; compacted.

SERTORIUS, *sėr-tō'rĭ-ŭs,* QUINTUS: one of the ablest Roman commanders in the later ages of the republic: b. in Nursia, in the country of the Sabines; d. B.C. 72. He began his military career in Gaul; fought B.C. 105 in the disastrous battle on the Rhone in which the Roman proconsul, Q. Servilius Cæpio, was defeated by the Cimbri and Teutones; and took part in the splendid victory at Aquæ Sextiæ (mod. Aix), B.C. 102, where Marius discomfited the same barbarians. On the breaking out of the sanguinary struggle between the party of the nobles under Sulla (q.v.) and the popular party headed by Marius (q.v.), B.C. 88, he espoused the cause of Marius. Morally he was much superior to the military adventurers of his time; and the impression given of him in Plutarch's pic-

turesque biography is that of a valiant, resolute, honest, and stubborn Roman, of a character more frequent in the 3d than in the 5th century of the republic. None of the Marian generals held out so long or so successfully as he against the victorious oligarchy. He fought in conjunction with Cinna the battle at the Colline Gate, which placed Rome at the mercy of the Marians; but he had no hand in the bloody massacres that followed; instead, he gathered his own troops and slew 4,000 of the ruffianly slaves whom Marius was permitting to plunder and ravish at will through the city. On the return of Sulla from the East, B.C. 83, Sertorius withdrew into Etruria; but finding it impossible to act in concert with the other military leaders of his party, he went to Spain, where he continued the struggle in an independent fashion, at first with so little success that he found it advisable to embark for Mauritania. Returning to the Peninsula, at the invitation of the Lusitanians, he gathered an army of natives, Libyans and Romans, and after a time became the virtual monarch of the whole country. During B.C. 80-76 he was victorious over all his opponents; nor was it until the arrival (B.C. 76) of young Pompey ('Pompey the Great') that he found an opponent worthy to cope with him; and even Pompey was scarcely yet his equal in military skill. Sertorius drove Pompey over the Iberus (Ebro) with heavy loss, and the campaign of the following year was of the same kind; for though Sertorius's subordinates were twice beaten, Pompey himself had no success, and was forced to write urgent letters to the senate for reinforcements. The campaigns of the next two years show the gradual operation of that miserable jealousy that wrought the ruin of Sertorius. Perperna, and other Roman officers of the Marian party, who had fled to him B.C. 77, when Sulla became triumphant at home, and who seem to have been a set of base adventurers, secretly stirred up the Spaniards against him; and when that artifice did not prove successful, they conspired against his life, and assassinated him in his tent under circumstances of shameful perfidy. With Sertorius Marian or popular cause sank, until it was revived and attained final success in the person of Julius Cæsar. Plutarch wrote Sertorius's life, and Corneille made it the subject of a tragedy.

SERTULARIA, n. *sér'tū-lā'rĭ-ă* [L. *sertum,* a wreath of flowers—from *serĕrĕ,* to plait]: genus of campanularian hydroids, in which the branched horny investment of the plant-like colony forms a cup around each polyp. The polyps are arranged in double row, and the colony is attached to stones, shells, sea-weeds, etc. See HYDRA: MEDUSA.

SERUM. See SEROUS; BLOOD.

SERUM THERAPY: a mode of treatment of disease by means of the modified blood serum of man or other

animal. It is one of the subdivisions of therapeutics and in its more scientific details is of distinctly modern development. In its early and crude forms, however, serum therapy is of very great antiquity. Serum therapy is employed both for its protective power as well as for its curative aid. Inasmuch as the gradual growth of knowledge concerning the protective power of blood serum has been in large part an offshoot of the study of bacterial poisons it is usual at the present time to include under the study of serum therapy a number of related subjects—particularly the effects of bacterial toxines in disease, hence they will be included in this account. It is related that King Mithridates knew that by taking small doses of snake poison he might render himself immune to larger doses and in this old, well-recognized principle one sees the early shadowings of the principle of isotherapy—that principle now so fully recognized that after all the body tissues are the best defense against infectious diseases. The exact details of all the protective processes are not as yet known, but enough have been discovered to place serum therapy on a sound basis. It has been known for a long time that many infectious diseases rarely attack a person a second time. This is characteristically true, for instance, in measles, scarlet fever, and whooping cough. It is less true for diphtheria, for typhoid fever, for pneumonia. When the discovery of bacteria made it evident that many of these diseases were due to these low plants, it was then shown that injections of the bacteria caused the disease, and that a certain grade of immunity was produced. Following this it was learned that it was not necessary to inject the bacteria themselves to get symptoms of the disease, but that the injection of the filtered products of their growth, that is, their toxins, might cause the same phenomena, and finally it was shown that as a result of the injections, either of the bacteria, or of their dead bodies, or of their filtered toxins, certain changes took place in the blood, and that new substances were formed in the blood which in different ways counteracted the effects of the injections; finally it was a logical step to develop these anti-bodies—as they have been called,—in the blood serum of another animal, and use this serum in the treatment of the particular disease in man. This is the simple explanation as applied in the serum therapy, say of diphtheria. After the success of the anti-diphtheritic serum became established it was thought that all of the infectious diseases would be immediately conquered by an application of the same principle, but in practically all instances it was found that whereas the principle worked out very definitely for diphtheria, it did not apply to other infectious diseases as directly, and the results while at times were seemingly excellent, at other times were very disappointing. This disparity between the good success in diphtheria with

antitoxic sera and the lack of results in other infections served to draw attention to the fact that the protective mechanisms in the blood serum were much more complicated than was at first thought. A new line of study was opened when it was shown that in some instances following the use of protective sera, the bodies of injected bacteria were found to be destroyed, that is, bacteriolysis resulted from the use of the serum. Thus in addition to a chemical antidote, antitoxic serum, a bacteria-destroying serum became a possibility. It is highly probable that in tuberculosis this bacteriolytic action of the blood serum is constantly at work. At about the same time, or even previously, the peculiar power that certain blood sera possessed in agglutinating, or causing bacteria to clump up and hang together, was observed in typhoid fever. This led to the discovery that certain specific substances, called agglutinins, were present in certain instances and that these agglutinins were protective devices elaborated by the body in its struggle with infectious micro-organisms. This peculiar property of agglutinating bacteria has developed one of the most reliable of tests —the so-called Widal reaction for the detection of typhoid fever. Thus far practical agglutinating sera have not been devised. Agglutination seems to be an active factor in immunity rather than a passive one. Two distinct phases are present, an active and a passive immunity, and at the present time it is the endeavor of serum therapy to bring into defensive action as many of the factors as possible. Thus by injecting into the human body living bacteria, which have had their virulence modified, either by growing them in oxygen, or by attenuation through growth in certain animals, or by subjection to high temperatures, or by growth in weak antiseptic media, a certain type of active immunity may be conferred. This principle is made use of in Haffkine's anti-cholera injections. In the sera used in combating the plague and in immunization against typhoid, injections of the dead bodies of bacteria are practised. Finally active immunity may be induced by the injections of filtered bacterial toxins. These three types of treatment apply the principle of prevention, however. They are meant to so enhance the protective agencies of the blood serum that infection shall not take place. They are not in any sense of particular service after the disease has once begun. They are only the first stages in the development of a curative blood serum. As illustrations of these methods the following may be mentioned: (1) Pasteur's preventive inoculations against anthrax in sheep—highly successful. The immunity lasts about a year. (See ANTHRAX.) (2) Jenner's vaccination against smallpox. (See VACCINATION.) (3) Haffkine's anti-cholera inoculations. Large bodies of men in India have been inoculated first by an attenuated virus, then by a strong virus. The results thus far are not conclusive, but they are encour-

aging. (4) Haffkine's anti-plague inoculations. In this the dead bacteria of the plague and their toxins are injected. These are prepared in a specified manner. According to recent reports of the Indian Commission the results are highly satisfactory, but better methods for standardizing the dosage are desirable. Other methods of combating the plague after it has attacked the body are in vogue. These belong to the section on passive immunity modes of treatment. Yersin and Lustig have developed these sera. (5) Wright's anti-typhoid inoculations. In this dead bacteria and their toxins are also used. The results reported from time to time are encouraging. In India, of 4,502 soldiers inoculated, only about 1 per cent contracted the disease, whereas of 25,000 uninoculated soldiers in the same station 2.5 per cent contracted the disease. Later reports, *British Medical Journal,* 1904, show even better results, but the technique of Wright's injections leaves much to be improved upon. (6) Pasteur's method of treatment of hydrophobia is an application of these same principles. In this the body is slowly immunized by using modified virus grown in a special medium, the spinal cord of dogs or rabbits, and before the actual infection takes place, immunity is effected during the incubation period of the disease. (7) Maragliano's anti-tuberculosis vaccination. This is one of the most recent (1904) of the efforts to confer immunity in this dread disease. This investigator after a number of years of experiment both in laboratories and in hospitals believes that it is possible to produce a specific therapy for tuberculosis. He has been able to immunize lower animals against the disease and his methods offer much hope for successful human immunization. The main principle of Maragliano's therapy is to create a peripheral focus of tuberculous inflammation without living tubercle bacilli and bring about by this means the active production of defensive materials. These defensive materials are antitoxins, bacteriolysins, and agglutinins. It is yet too early to pronounce upon Maragliano's success, but his studies have served to reawaken a keen interest in the serum treatment of this disease which by reason of many failures had almost become despondent. The good work done by Trudeau in this country will probably commence to bear fruit under the magnificent philanthropy of the Phipps Institute for the Study and Cure of Tuberculosis. A large number of immunization methods have been devised for other diseases, and others will be tried, but up to the present time, those enumerated alone seem to offer real hope for results. It is needless to point out that all of these advances have come through the honest workers in the medical profession. Secret commercial enterprises are notoriously unreliable and border on quackery if not criminality. All of the methods which have just been enumerated are prophylactic rather than curative. They seek to prevent the diseases in question.

SERUM THERAPY.

The use of antitoxic and antibacterial sera—serum therapy in the narrow sense—is meant to be distinctly curative of the conditions after infection has definitely taken place. Technically speaking these sera bring about what is known as passive immunity. Two distinct kinds of sera are being used. (1) Antitoxic sera and (2) Antibacterial sera. In both of these antibodies are developed in the serum of another animal. (1) The antitoxic sera are the most promising—that for diphtheria having been proven to be the most efficient. Concerning its value there is at the present time almost no doubt. A great reduction in the mortality of diphtheria has resulted since the beginning of its use by Behring in October, 1894. Antidiphtheritic serum is developed in the horse. The process of manufacture is described elsewhere. It is important that in practice the serum should be used early in the disease, as it has been shown that the mortality of the disease is only about 7 per cent when treatment has been begun on the first or second day of the disease, while after the fifth day it seems to be of little service. The amount to be given is very difficult to determine. The other most important antisera are for streptococcus poisoning (blood poisoning), for tetanus, for plague, for pneumonia, and for snake bite. Others may in time be developed. In the treatment of acute tetanus (lockjaw), the results have not yet proven absolutely satisfactory, some patients have seemed to be benefited, others not. Two sera are in use. (1) Behring and Roux; (2) Tizzoni. It seems that the latter serum is the more successful. Some have ascribed this to a diminished virulence of the tetanus organism in Italy. A serious bar to a successful therapy is present in this disease in the great resistance shown by the nerve-cells to the diffusion of the serum. To obviate this, intraspinal and intracranial injections of the serum have been practised. The results have not yet proven more satisfactory.

The antistreptococcic sera are in the experimental stage only. Just why results have not been obtained is not yet clear, but there are many different kinds of these streptococci and it may be that each form has its own particular type of poison that can be counteracted only by a serum developed with a similar form. The subject is slowly emerging from a highly technical condition, and better results may be hoped for. Very striking results have been obtained from some of the antivenen sera, particularly in treating the cobra poisoning by Calmette's serum, but the subject is still in the experimental stage. Antipneumococcic sera are not yet available. Such will constitute a great blessing when they finally are evolved. The natural history of pneumonia, and the known characters of the pneumococcus, both offer considerable theoretical hope that an efficient antipneumonia serum can be manufactured.

True bacteriolytic sera have not yet been devised as

specific means of therapy. Such sera, as Yersin's anti-plague serum, which have been made are thought to act partly as antitoxic, partly bacteriolytic, but all of the details are not yet available. Very recently the suggestion has come from Ehrlich that immunity to Protozoan diseases is possible. Summarizing the results then of serum therapy it may be said that (A) active immunity can be imparted with great hope of success in (1) Small-pox, (2) Rabies, and (3) Anthrax, in animals; with reasonable hope of positive value in (1) Cholera, (2) Typhoid, (3) Plague, and (4) Tuberculosis. That (B) curative antisera are of positive value in (1) Diphtheria, and (2) Snakebite, and that hopeful results have been obtained in (1) Tetanus, (2) Plague, (3) Dysentery, (4) Pneumonia, (5) Blood-poisoning (streptococcus), (6) Scarlet Fever.

SERVAL, *sėr'val* (*Felis Serval* or *Leopardus Serval*): one of the smaller *Felidæ*, native of s. Africa; the *Boschkatte*, or Bush-cat, of the Cape Colony. It is about two feet in length, exclusive of the tail. The serval is one of the mildest and most docile of the *Felidæ*—a beautiful animal, yellowish with black spots, the lower parts white with black spots. The fur is in great request, and is known to furriers as that of the *Tiger Cat.*

SERVE, v. *sėrv* [F. *servir*, to serve—from L. *servīrĕ*, to be in service—from *servus*, a servant or slave: It. *servo*, a servant]: to work for; to perform duties, as an officer in the army or navy; to assist; to attend at command; to yield obedience to; to supply with anything; to suffice for; to stand in place of something else; to officiate or minister, as a clerygman; to be a servant or slave; to be subordinate to anything; to treat or requite, generally in an ill sense; to worship God; to present a writ; to attend or wait; to accomplish an end; to suit or be convenient; to manage, as cannon. SER'VING, imp.: N. among *seamen*, the process of covering large ropes or cables with canvas or spun yarn to prevent friction or wearing in parts much exposed. SERVED, pp. *sėrved.* SER'VER, n. *sėr'vėr*, one who serves; a salver. SER'VANT, n. *-vănt*, a person employed by another for labor and to be at his command. (See MASTER AND SERVANT.) V. in *OE.*, to reduce to the condition of a servant. TO SERVE IN, to belong to and do duty in, as in the army or navy. TO SERVE ONE OUT, to retaliate upon; to requite. TO SERVE ONE'S SELF, to act as one's own servant; to take or use without help; to avail one's self of. TO SERVE OUT, to distribute in portions; to punish; to retaliate. TO SERVE UP, to place on the table, as dressed food. TO SERVE A WRIT OR SUMMONS, to read it to the defendant, or, more usually, to leave an attested copy at his residence. TO SERVE A WARRANT, to show or read it to the person against whom it is issued, and to seize his person. TO SERVE AN EXECUTION, to seize or take possession of lands, goods, or

person, according as the law requires in the case. To SERVE A ROPE, to roll something around it to prevent its injury from friction. To SERVE AN OFFICE, to discharge the duties of a public office. TIME-SERVER, one who regulates his actions by the requirements of the times instead of by duty; one who meanly complies. A SERVANT OF SERVANTS, one debased to the lowest conditions of servitude. YOUR HUMBLE SERVANT, YOUR OBEDIENT SERVANT, etc., conventional phrases of civility at the close of a letter. SERVANT GIRL or MAID, or SERVING-MAID, a female servant. SERVANT-MAN, or SERVING-MAN, a male servant. —SYN. of 'serve, v.': to minister to; obey; promote; aid; assist; help; succor; benefit; wait; attend; be sufficient; answer; work for; supply; satisfy; content; treat; requite; worship; present; discharge; conduce.

SERVETUS, *sėr-vē'tŭs*, MICHAEL, or, in his native Spanish, MIGUEL SERVEDE: notable and unfortunate speculator in theology: 1511-1553, Oct. 27; b. Tudela, in Navarre; son of a notary of good family in Aragon. [This is according to his Vienne deposition: in Geneva he gives his birthplace as 'Villeneufve.'] At the age of 19 he quitted Spain, and commenced the study of law at Toulouse, which he soon abandoned to apply himself with ardor to the knotty points of the Reformation doctrines. In 1530 he went to Basel to hear Œcolampadius, and thence to Strasburg, where Bucer and Capito taught. His daring denial of the doctrine of the Trinity frightened or angered these divines to such a degree that they denounced him as 'a wicked and cursed Spaniard.' Servetus appealed from their judgment to that of the public in his *De Trinitatis Erroribus Lib. VII.* (Haguenau 1531; modern edition, Nürnberg, 1791), and his *Dialogues* (Haguenau 1532), but the public thought as little of his teaching as the theologians; and to avoid the odium which it had occasioned, he changed his name to Michael de Villanueva, and fled to Paris, where he studied medicine under Sylvius and Fernel, and took his degree as a physician with honors. Servetus seems to have possessed a penetrating though rash and restless intellect, which enabled him to *hit* truth occasionally in his flighty researches, or, at least, to make happy guesses in the right direction: e.g., he had an idea (see Flourens in *Journal des Savants,* 1854, Apr.) of the doctrine of the circulation of the blood. He attacked Galen and the faculty with his customary violence in a treatise on Syrups (*Syruporum Universa Ratio,* Paris 1537, Lyon 1546). About this time he opened a correspondence with Calvin, from whom at last he asked a safeguard for a visit to Geneva. Calvin, profoundly indignant both at Servetus's views and at his mode of advocating them, refused, and writing to Favel, 1546, Feb. 13, said: 'If ever he enters the city, he shall not leave it living, if I can prevent it.' After living successively at Lyon, Charlieu, and Avignon,

supporting himself by writing for the booksellers, he found an asylum in the palace of Pierre Paulmier, Abp. of Vienne, 1541, where—apparently in full conformity to the Rom. Cath. Church—Servetus remained some years: where also he wrote his famous *Christianismi Restitutio*, pub. 1553. The work has been twice reprinted, first by Dr. Meade of London (incomplete), and again by Murr, Nürnberg 1790. Its celebrity is due more to the fact that is sealed the fate of its author, than to its intrinsic merits, the ideas being obscure and the style incorrect. The authorship was traced to Servetus by means partly of samples of Servetus's handwriting which were sent by Calvin. Servetus was imprisoned at Vienne, but escaped (1553, Apr. 7), and set out for Naples; but he seems to have tarried nearly a month at Geneva, and being recognized, Aug. 13, was imprisoned on a formal accusation against him by Calvin (q.v.). [Another account relates his arrest on the day of his arrival.] After a long and complicated judicial procedure, Servetus was condemned to be burned, though Calvin would have had him beheaded; and the sentence was carried into execution the next day.

Servetus showed some traits of genius, with much rashness of thought and great self-confidence in argument and reasoning, due partly perhaps to the fact that he was utterly without scientific training in theology—having been self-taught. Both his character and his career are a puzzle. His writings give an impression of sincerity. No law then in force at Geneva has ever been adduced authorizing the sentence of death, or any penalty in such a case except banishment.—The fate of Servetus, after all conceivable palliations are weighed, remains a black stain on the memory of Calvin.—See Willis's *Servetus and Calvin* (London 1877): also a valuable collection of opinions on the case, in *De Hæreticis, aut sint persequendi . . . Sententiæ* (Magdeburg 1544).

SERVIA, *sėr'vĭ-a* (*Srbija*): proclaimed a kingdom 1882, Mar. 6; but a principality tributary to Turkey till 1878, when the Berlin Conference recognized its independence. It is a part of the Balkan Peninsula: its frontiers touch those of Austria, Roumania, Bulgaria, and Turkey; 18,630 square miles; population estimated (1904) 2,676,989 (of present area, 4,000 square miles were added 1878, and of the population more than 300,000). The country is mountainous and densely wooded. From the interior, numerous chains proceed northward, forming massive barriers on the east and west frontiers, and sloping steeply toward the swampy plains along the Save and the Danube. In the extreme northeast, near Orsova, they reach the very edge of the Danube, and with the Eastern Carpathians, on the opposite shore, imprison the great river within a wall of rock, known as the *Iron Gate* of the Danube. The highest of these chains is the Rudnik Mts. (gathered into a knotty group about the center of

the state), which in the Great Schturaz rises 3,400 feet. The *Schumadia*, or Forest, extends south from Belgrade for 60 miles. The principal rivers (Servian *Rjeka*) flowing through the country are the Morava and Timok, affluents of the Danube, and the Kolubara, affluent of the Save, which itself falls into the Danube at Belgrade. The climate is temperate and salubrious, but somewhat cold in the higher regions. The soil in the valleys and level districts is fertile, and equally fitted for the raising of cattle, and for production of corn and wine. Beech, oak, and fir trees abound. The agricultural products of Servia include wheat, barley, oats, maize, hemp, flax, meadow grass, plums, tobacco, and vine products. Silk culture is extensive, annual shipments of cocoons being exported. Cattle, sheep and pigs are raised and exported in large numbers. The mineral wealth of Servia, as yet nearly all partially idle, embraces gold, copper, lead, zinc, antimony, and silver. Some mining is done in each of these, and interest in mining work is steadily developing.

Government.—The executive authority is vested in the king, who is assisted by a council of eight ministers with special departments. In legislation the king has to act through and with the national assembly, known as *Skupshtina*, and the senate. The latter consists of 51 members, comprising the heir-apparent, the primate of Servia, the bishop of Nish, 30 nominated life-members, and 18 elected members. The Skupshtina consists of 130 members, all elected by the people. An elected member of the senate must be at least 40 years old and must pay an annual tax of 200 dinars. Every Servian of not less than 21 years of age who pays direct taxes to the amount of 45 dinars per annum is entitled to vote in the senatorial elections. Thirty is the minimum age for deputies, and the minimum annual tax is 60 dinars. The right to vote for deputies belongs to all tax-paying citizens. The army has since 1883 been remodelled and extended: 1889, Jan. 31, military service was made compulsory and universal. The military peace strength of Servia includes: infantry, 1,142 officers and 17,193 men; cavalry, 123 officers and 1,551 men; artillery, 343 officers and 4,437 men; and engineers, 75 officers and 942 men. The total available war strength is about 175,000.

Religion, Education, and Commerce.—The inhabitants nearly all belong to the Greek Church (Established), but are independent of the Patriarch of Constantinople. Ecclesiastical affairs are managed by a metropolitan, whose seat is at Belgrade, and by the three bishops of Uzitza, Shabatz, and Timok. For the few who acknowledge the authority of the pope and the Latin Church, there is a bishop *in partibus infidelium*, but who resides at Diacobar in Austrian Slavonia. The principal industries are flour milling, brewing, sugar refining, and celluloid making. The last two named are worked by German capital. Weaving, tanning, bootmaking, pottery

work, and iron implement products are among the minor industries. Since 1898, when foreign capital was invited by offers of free land, exemption from customs duties and other taxes and liberal tariff privileges, there has been a continual accession of foreign manufactures and investors. Imports to 1904 amounted to over $12,000,000; exports from Servia, $13,000,000. There are over 350 m. of railroad, 2,040 m. of telegraph lines, with 4,450 m. of wire and 174 offices. The telephone mileage is over 500, with nearly 1,000 stations.

Early History.—Servia was anciently inhabited by Thracian tribes; subsequently it formed part of the Roman province of Mœsia. It was afterward occupied in succession by Huns, Ostrogoths, Lombards, Avares, and other tribes. The Servians entered it in the 7th century, and were converted to Christianity in the next century. They acknowledged the supremacy of the Byzantine emperors, but latterly made themselves independent, and under Stephen Dushan (1336-56) the kingdom of Servia included all Macedonia, Albania, Thessaly, northern Greece, and Bulgaria. About 1374 a new dynasty ascended the throne in the person of Lazar I., who was captured by the Turks at the battle of Kossova (in Albania) in 1389, and put to death. Servia now became tributary to Turkey. About the middle of the 15th century it became a Turkish province, and so remained for nearly 200 years. By the peace of Passarowitz in 1718 Austria received the greater part of Servia, with the capital, Belgrade. But by the peace of Belgrade in 1739 this territory was transferred to Turkey. The barbarity of the Turks led to several insurrections. Early in the 19th century Czerny George placed himself at the head of the malcontents, and, aided by Russia, succeeded after eight years of fighting in securing the independence of his country by the peace of Bucharest, 1812, May 28. The war was renewed in 1813, and the Turks prevailed. In 1815 all Servia rose in arms under Milosh, and after a successful war obtained complete self-government, Milosh being elected hereditary prince of the land. Milosh was compelled to abdicate in 1839, and was nominally succeeded by his son Milan, who died immediately, leaving the throne vacant to his brother Michael. In 1842 this prince was compelled to follow the example of his father and quit the country. Alexander Karageorgevitch, son of Czerny George, was elected in his room; but in December, 1858, he also was forced to abdicate. Milosh was then recalled, but survived his restoration little more than a year. His son Michael succeeded him (1860), but was assassinated by the partisans of Prince Alexander 1868, July 10. The princely dignity was then conferred on Milan (Obrenovitch), grand-nephew of Milosh. After the fall of Plevna in the Russo-Turkish war of 1877-8 Servia took up arms against Turkey, and by the treaty of Berlin 1878, July 13, it obtained an accession of ter-

ritory and the full recognition of its independence. It was erected into a kingdom in 1882. In 1885 a short war took place between Servia and Bulgaria, resulting in favor of the latter. In 1889 Milan abdicated in favor of his son, Prince Alexander, b. 1876, Aug. 14, who became the ruler of the country as Alexander I.

Recent History.—In 1890 a regency of three appointed as guardians of the young king practically controlled the government. The Radicals also gained a majority of the National Assembly and formed the cabinet. Factional troubles made the first few years of Alexander's reign exceedingly stormy. In 1892 the three regents dissolved the cabinet, and a new one, composed of Liberals, came in. In 1893, Alexander, then 17 years of age, took matters in his own hands, and decided to save the dynasty. He declared himself of age, took away the power of the regents and took the reins of power. He appointed a cabinet, made up mostly of moderate Radicals, and his action nearly precipitated a revolution. In 1894 Alexander appointed a so-called non-partisan cabinet and his father again became head of the army, an act which caused Russia to break off diplomatic relations with Servia in 1898. In 1894 the king also annulled the new constitution and re-established that of 1888, giving himself more power. But discontent and threatened uprisings caused another change to a freer constitutional government in 1897.

Milan and his son had too many characteristics in common to get on well together, however, so Milan went to the gambling resorts of Europe and finally died an exile in Austria in 1901.

One of the causes of the break between father and son was the king's betrothal and marriage to Draga Maschin in 1900. She was 12 years older than the king and had been a lady in waiting. The Servian ministry declared the proposed marriage preposterous and a menace to the state, and promptly resigned.

King Alexander paid no attention to opposition and married Mme. Maschin in Belgrade on Aug. 5, 1900. Though the marriage had been violently opposed by officials of the government, the people apparently had no objection and heartily cheered the bridal party. The king took the precaution, however, to line the streets with troops. Disturbances and threatened revolution together with quarrels between the king and his wife kept the country in turmoil. In June, 1903, a revolt occurred among the army officers, and King Alexander, his wife, and several of his household were brutally murdered in the palace at Belgrade. The conspirators, comprising some of the principal statesmen and chief officers of the army, communicated with Prince Peter, the Karageorgevitch pretender, at Geneva, and, having satisfied themselves that he would accept the throne in the event of its

becoming vacant and that he would prove a satisfactory king, they proceeded to put their plans into execution.

It is not wholly clear whether the plot as originally conceived involved assassination of Alexander, the inference being that the murderous scenes in the palace at Belgrade resulted from the resistance which the conspirators encountered on that fateful night when they set forth to obtain from Alexander his abdication and his pledge to leave Servia. Be this as it may, the plot resolved itself into a most savage onslaught upon the defenseless king and queen by their assailants, who, after having emptied their revolvers upon the ill-fated couple, set to work to slash the body of Draga with their sabres until it had lost all human semblance, after which they pitched both corpses out of the window into the garden below. On the following morning Peter Karageorgevitch was proclaimed king of Servia in Alexander's stead, and a week later he arrived in Belgrade and took possession of the blood-stained throne. The country was comparatively quiet for a number of years, until Austria-Hungary asserted authority over Bulgaria, a proceeding that Servia resented. While the matter was pending, both Servia and Austria mobilized troops on the frontier, and in the early months of 1909, every indication pointed to war, unless the powers in concert intervened and prevented the peace of Europe being disturbed. See TURKEY.

Language and Literature.—The Servian language, called also the Illyrian, belongs to one of the four great divisions of the Slavic family, and is more nearly allied to Russian than to Polish or Bohemian. It is distinguished from the other members of its division by the predominance of vowels, and consequently by its soft, melodious resonance. This character it owes in part to the influence of the Italian and Greek languages—the former influence being the result of commercial intercourse; the latter, of community of religious belief. The long domination of the Turks has also left unmistakable traces on the Servian tongue; nevertheless, it has preserved a Slavic character, possessing a complete system of declension and conjugation, and a free syntax.

After their conversion to Christianity, the Serbs, like the Russians, employed the old Slavic church-language in writing, but in two different styles, one called the church style, the other the chancery or legal style. The most important monument of the latter is the *Law-book*, published by King Stephen Dushan, though the oldest extant specimens date back as far as the 11th century. The literary remains of the former are more numerous, and embrace ecclesiastical, devotional, and historical works, composed mostly by the clergy and the monks. With George Brankovitch (1645-1711), who wrote a *History of Servia* from the origin of the nation to his own time, this first or mediæval period in Servian literature closes.

The second or modern period is characterized in its commencement by an effort to raise the spoken language of the Serbs to the dignity of a written language. The consequence was, that for a considerable time the literary language of Servia was a chaos of confusion, writers not appearing able to make up their minds which dialect to use, and spoiling their productions by a barbarous mixture of both; and it was not till Vuk Stephanovitch published his *Grammar of the Servian Language* (1814), and his *Songs of the Servian People,* that the victory of the reformers was complete. Since then, the spoken language of Servia has become the language also of literature. These Servian popular songs or ballads constitute by far the finest part of Servian literature. The picturesque scenery of the land, and the free solitary life of the mountain ranges, kindled the imagination of the people, and awoke the voice of song at an early period. Some of the ballads—now widely known throughout Christendom by translations—go back to a period anterior to the appearance of the Turks in Europe. In a wonderful manner, they combine the rude strength, spirit, and naïveté characteristic of the ballad everywhere with oriental fire and Greek plasticity. They are invariably unrhymed, but preserve at the same time a rhythmic measure. See Kapper's *Volkslieder der Serbien* (2 vols. Leip. 1852); and Bowring's *Servian Popular Poetry* (Lond. 1827), and Owen Meredith's (i.e., Earl Lytton's) *Serbske Pesme* (Lond. 1861). Of modern vernacular poets the greatest is Branko Raditchevitch (1824-53), creator of modern Servian literature—the Servian Burns, as he has been called. Others are, Abp. Muschicki (died 1837), Milutinovitch (died 1848), Jovanovitch, Jakchitch, Ilitch, Rakitch. Georgevitch, Niegosch, Kengelaz, Rajitch, and Milutinovitch have written history. Science has made little progress. In another branch of the Servian people—the so-called Illyrians, especially the Dalmatians, who profess the Rom. Cath. faith—literature received an earlier and more artistic development than among the Serbs of the Greek Church. In the 12th century, a priest of Ducla (Dioclea) wrote a Chronicle, first in Slavic, afterward in Latin, fragments of which are extant. During the 13th and 14th centuries, devotional works in the vernacular were numerous, and toward the end of the 15th century the republic of Ragusa (Slav. Dubrovnik) obtained the name 'Illyrian Athens' for the brilliant success with which it cultivated literature, art, and science. Epic, lyric, and dramatic poetry, history, and jurisprudence, are admirably represented. The list of poets is particularly large. Toward the end of the 18th century, literary activity abated among the southern or Illyrian Serbs, but began to increase in the north, especially in Croatia and Hungary.—See Ristitz, *Ueber die Serb. Literatur* (Berl. 1853), and, in English, Talvi's *Historical View of the Languages and Literature of the*

Slavic Nations (New York 1850); also Schafarik's *Geschichte der Südslawischen Literatur* (1864), and Novakovitz's *Istorija srpske Knijzevnosti* (Belgrade 1867). There are numerous grammars and dictionaries.

SERVICE, n. *sėr'vĭs* [F. *service*—from L. *servĭtĭum*, the condition of a slave or servant—from *servus*, a slave or servant: It. *servizio*]: labor, physical or mental, performed in course of duty, or for the benefit of another; the place or business of a servant; profession of respect uttered or sent; obedience; religious rites or worship; public worship; the obedience due to God; in *Chh. of Eng.*, the music to which the Te Deum and Canticles are set; employment; use; purpose; advantage; official duties of a clergyman; employment in the army or navy under govt.: a benefit conferred; favor; a course, as of dishes at table; a collection of vessels used at table; among *seamen*, the layers of spun yarn fastened round a rope to protect it from friction. SER'VICEABLE, a. *-ă-bl*, useful; beneficial; capable of duty. SER'VICEABLY, ad. *-ă-blĭ*. SER'VICEABLENESS, n. *-bl-nĕs*, the state or quality of being serviceable. SERVICE AND WORK, name often given to an action brought by one who has done work to order, or on request, or has been engaged for a specific time. SERVICE-BOOK, a prayer-book or missal. SERVICE-PIPE, a pipe connecting mains with a dwelling, as for gas or water-pipes. ACTIVE SERVICE, engaged in actual warfare, or in duties connected therewith. CIVIL SERVICE, see that title. FOREIGN SERVICE, military service outside the territory regarded as the home-land of a nation, as opposed to *home service*.—SYN. of 'service': utility; avail; usefulness; office; attendance; place; obedience; submission; employment; business; use; purpose; advantage.

SERVICE, or SERVICE-TREE, n. *sėr'vĭs* [L. *sorbus*, the service tree]: one of several trees allied to the apple and pear trees; the *Pyrus sorbus* or *P. domes'tĭca*, ord. *Rosăcĕæ*, akin to the mountain-ash (see PYRUS); the *Sorbus domesticus* of many botanists. It is a tree 50 or 60 ft. high, with pinnated leaves, which are downy beneath, and their leaflets serrated upward, and small white flowers in panicles; found in various parts of Europe, w. Asia, and n. Africa; and cultivated for its fruit, which is obovate, and about an inch in length, resembling a small pear, but pleasant only in a doughy and overripened state, like the medlar. It is more cultivated in Italy, Germany, and France, than in Britain. The tree is of very slow growth, and attains great age. The timber is valuable, very heavy, fine-grained, and susceptible of high polish, possessing a strength and durability which particularly adapt it for some purposes of the machine-maker. It is used also for making mathematical rulers, etc.—The name WILD SERVICE is given to an allied species, *Pyrus torminalis*, called also the SORB, a common native of middle and s. Europe—a small tree, with spotted fruit considerably larger than that of the common hawthorn,

which, like the fruit of the true service, becomes mellow and pleasant by keeping, and is regularly brought to market in many parts of Europe. The dried fruit is used in some places as a cure for diarrhea. The wood is highly valued: it is hard and tough, yellowish-white, with brownish-red and dark-brown streaks.—See JUNEBERRY: SHAD-BUSH.

SERVIETTE, n. *sėr-vĭ-ĕt'* [F.]: a table-napkin.

SERVILE, a. *sėr'vīl*, or *-vĭl* [F. *servile*—from L. *servīlis*, slavish, servile—from *servus*, a slave or servant; It. *servile*]: pertaining to a servant or slave, or characteristic of one; dependent; cringing; mean; fawning; meanly obsequious: in *gram.*, not belonging to the original root, as a *servile* letter; also said of a letter not sounded, or silent. SER'VILELY, ad. *-lĭ*. SER'VILENESS, n. *-nĕs*, or SERVILITY, n. *sėr-vĭl'ĭ-tĭ*, the condition of a slave or bondman; mean submission; slavish deference; obsequiousness.

SERVITE, n. *sėr'vīt* [It. *servitore*, a servant]: in *chh. hist.*, the name commonly given to a monastic order, the Religious Servants of the Holy Virgin, founded 1233 by seven Florentine merchants at Mt. Senario, near Florence. In 1487 Pope Innocent VIII. bestowed on the Servites the privileges of the four mendicant orders. The life is one of austerity and continual prayer; and the rule is a modification of that of St. Augustine. Since the French Revolution many houses have been founded in different countries.

SERVITOR, n. *sėr'vĭ-tėr* [F. *serviteur*, a servant—from mid. L. *servitor*—from L. *servus*, a slave or servant]: a follower or adherent; an attendant; an Oxford undergraduate partly supported by the college funds. SER'VITORSHIP, n. office or position of a servitor. SER'VITUDE, n. *-tūd* [F.—L.]: the condition of a servant or slave; slavish dependence; bondage: in *Scotch law*, term borrowed from the Roman law to denote that kind of right or interest which a person may have in land of which he is not owner—e.g., right of passage, pasture, aqueduct, etc.; also Life Estate (q.v.). PENAL SERVITUDE. See under PENAL.

SER'VIUS TUL'LIUS. See ROME.

SERVUS SERVORUM DEI, *sėr'vŭs sėr-vō'rŭm dē'ī* [Lat. Servant of the Servants of God]: form of subscription adopted by the Roman pontiffs from the days of Pope Gregory the Great, by whom, according to his biographer, Paul the Deacon, it was assumed as a practical rebuke of the ambitious assumption of the title of 'Ecumenical (or universal) Patriarch,' by John, surnamed Nesteutes, or the Faster, the contemporary Patriarch of Constantinople. Gregory is said, indeed, by Paul to have been the first Christian bishop by whom this humble form was employed: but this is certainly a mistake, the same designation having been frequently used by bishops be-

fore the time of Gregory. Gregory was probably the first of the bishops of Rome to adopt it as a distinctive title. It is found in all the letters of Gregory which Venerable Bede has preserved in his History.

SESAME, n. *sĕs'ă-mē,* or SES'AMUM [L. *sesămum;* Gr. *sēsămon,* an Eastern oily grain: It. *sesamo:* F. *sésame*]: genus of plants of nat. order *Bignoniaceæ,* sub-order *Pedaliaceæ,* a sub-order characterized by wingless seeds, and placentæ with woody lobes, attached to the inner wall of the fruit. The calyx of sesame is five-parted; the corolla bell-shaped and five-parted, the lowest lobe prolonged; the stamens four, two longer than the others, and a rudimentary fifth stamen; the capsule is oblong, almost four-celled, two-valved, many-seeded. The species are natives of India and Africa, and are annual plants, covered with hairs, their flowers solitary in the axils of the leaves, on very short stalks. They are so similar as to be sometimes reckoned mere varieties of one species, *S. Indicum.* The sweet oleaginous seeds are used in some countries, as in central Africa, for making a kind of hasty-pudding. In Egypt, they are eaten, strewed on cakes. The bland fixed oil of sesame obtained from the seeds by expression, is used as food, and for medicinal purposes, like olive oil. It keeps long without becoming rancid. It is much used by the women of Egypt as a cosmetic. Chiefly for its oil sesame is much cultivated, as it has been from very ancient times, in India, China, Japan, and many tropical and subtropical countries. The oil cake, mixed with honey and preserved citron, is an oriental luxury. The leaves of sesame abound in a gummy substance, which they readily impart to water, making a rich bland mucilage, used in the southern United States as a demulcent drink. Sesame is sometimes called *Tilseed.* Sesame oil can be employed instead of olive oil in a myriad of ways, as for culinary purposes, food, medicine (having a laxative effect), cosmetic, illumination, lubrication, soap-making, etc. It is also employed as an adulterant for olive-oil, but is itself adulterated with peanut-oil. It is known as bene or benne, and as gingil-oil. OPEN SESAME [from the well-known tale of Ali Baba and the Forty Thieves]: a talisman or specific in any form, used successfully to accomplish an object.

SES'AME GRASS. See GAMA GRASS.

SESAMOID, a. *sĕs'ă-moyd,* or SES'AMOID'AL, a. *-ăl* [Gr. *sēsămon,* sesame; *eidos,* appearance]: shaped like a grain of sesame. SESAMOID BONES, small bones in the substance of the tendons of muscles in the neighborhood of certain joints. In the human subject, the patella is the best example; and beside it, they are usual only on the palmar aspect of the joint which unites the metacarpal bone with the first phalanx, and in the corresponding position in the toe, there being two in each position, and their object being to increase the leverage of the short flexor

muscles of the thumb and toe. They are much more abundant in the great majority of mammals than in man.

SESBA'NIA. See DHUNCHEE.

SESHA, *sā'sha:* in Hindu Mythology, the great king of the serpent race, on which Vishn'u reclines on the primeval waters. He has a thousand heads, which also serve as a canopy to Vishn'u; and he upholds the world, which rests on one of his heads. His crest is ornamented with jewels. Coiled up, Sesha is the emblem of eternity. He is often called *Vâsuki* or *Ananta,* the eternal.

SESOSTRIS, *sē-sŏs'trĭs:* Greek name of a celebrated Egyptian monarch, who, in what must be deemed the legends of the Greek historians, is related to have conquered all Asia and Ethiopia, indeed the whole known world. His name has passed into the series of those conquerors who have achieved universal empire. According to the Greek legendary history, when Sesotris mounted the throne of Egypt, he began his scheme of conquest, first dividing Egypt itself into 36 nomes, placing his brother as regent, and laying on him injunctions not to assume the diadem, or interfere with the royal harem. Sesostris then marched at the head of a large army, and invaded Libya, Arabia, Asia, penetrating further e. than Darius. Advancing through Asia Minor, he invaded Europe, and subdued Thrace and Scythia, leaving a colony at Colchis on his return. In the s. he subdued Ethiopia, and placing a fleet on the Red Sea, conquered the adjacent isles, and extended his dominions to India itself. On his return to Egypt from his northern campaigns, his brother, who had disobeyed his instructions, endeavored to destroy him, by inviting him to a banquet at Daphnæ, and treacherously attempting to burn him and his whole family by firing the house; but Sesostris threw two of his children into the fire, and making a bridge of their burning bodies, escaped. Sesostris, in his triumphs, dragged his captives attached to the wheels of his chariot. The captives were employed on the public works, the enlargement of the Hephæsteum at Memphis (q.v.), and other temples, and in construction of canals and mounds. Memorials of his reign, it was said, were left as steles or tablets in the conquered countries; and Herodotus saw some in Palestine, which are supposed to be the tablets of Rameses II. (see RAMESES), still existing in the pass of Nahr-el-Kelb, or the Lycus, and the sculptured rock at Nymphi, near Smyrna. Sesostris is said to have grown infirm and blind after a reign of 33 years, and to have ended his days by his own hand.

Utter confusion prevails as to identification of this monarch, among both modern and classical authors. Herodotus places his reign long before that of Cheops of the 4th dynasty. Dicæarchus makes him rule B.C. 3712, and is followed by Aristotle and other authors. Bunsen supposes more than one monarch of this name, and that

one was Tosoithos, of the 3d dynasty; another Sesortesen II. of the 12th dynasty. Lepsius conjectures that Sesostris is the Sethos I. and Rameses II. of the 19th dynasty. But the exploits of Sesostris seem a conglomeration of the conquests of the kings of the 18th and 19th dynasties, especially the Thothmes and Rameses (q.v.), who extended the empire of Egypt far to the west and east. No one monarch of the Egyptian monarchy can represent Sesostris.—Herodotus, ii. c. 102; Diodorus, i. c. 55-57; Val. Flaccus, v. 419; Strabo, xvi.; Wilkinson *Mann. and Cust.* i. 99-106; ii. 70; iii. 190; Lepsius, *Einleit.* s. 278; Bunsen, *Ægyptens Stelle,* book ii. 85, 86, 312-324.

SESQUI, *sĕs'kwĭ* or *sĕs'kwī* [L. *sesqui,* more by a half]: a prefix in chemical terms which denotes that 1½ equivalents of one constituent is united to one equivalent of another, or in the proportion of three to two.

SESQUIALTER, a. *sĕs'kwĭ-ăl'tėr,* or SES'QUIAL'TERAL, a. *-ăl* [L. *sesquialter,* one and a half—from *sesqui,* more by a half; *alter,* other]: denoting the relation of 1½ to 1. SES'QUIAL'TERA, n. *-tėr-ă,* a compound stop on the organ, composed of five, four, three, or two ranks of open metal pipes, tuned in thirds, fifths, and octaves to the diapason. SESQUIALTERAL FLORET, in *bot.,* a perfect floret accompanied with a small abortive one.

SESQUICARBONATE, n. *sĕs'kwĭ-kâr'bō-nāt* [L. *sesqui,* more by a half, and Eng. *carbonate*]: a salt composed of 1½ equivalents of carbonic acid and 1 equivalent of any base, or in the proportion of three of the one and two of the other; also similarly of other salts.

SESQUIOXIDE, n. *sĕs'kwĭ-ŏks'īd* [L. *sesqui,* more by a half; Eng. *oxide*]: an oxide in which two atoms of a metal combine with three atoms of oxygen, as in the red rust of iron.

SESQUIPEDAL, a. *sĕs'kwĭ-pē'dăl,* or SES'QUIPEDA'LIAN, a. *-dā'lĭ-ăn* [L. *sesqui,* more by a half; *pedālis,* of or belonging to a foot—from *pes* or *pedem,* a foot]: containing a foot and a half; long-worded; using long words. SES'QUIPEDAL'ITY, n. *-dăl'ĭ-tĭ,* the practice of using long words.

SESQUIPLICATE, a. *sĕs-kwĭp'lĭ-kāt* [L. *sesqui,* more by a half, and Eng. *plicate*]: a term applied to the proportion one quantity or number has to another, in the ratio of one and a half to one.

SESQUITERTIAN, a. *sĕs'kwĭ-tėr'shan* [L. *sesqui,* more by a half; *tertĭānus,* belonging to the third—from *tertĭus,* third]: having the ratio of one and one-third to one, as between 8 and 6.

SESQUITONE, n. *sĕs'kwĭ-tōn* [L. *sesqui,* more by a half, and Eng. *tone*]: in *music,* an interval of three semitones.

SESSA, int. *sĕs'să* [L. *cessa,* leave off, have done]: in *OE.,* quiet, gently.

SESSILE, a. *sĕs'sĭl* [F. *sessile*, sitting—from L. *sessĭlĭs*, of or belonging to sitting—from *sedĕō*, I sit]: having a position as if sitting: in *bot.* and *zool.*, sitting directly upon

Sessile Leaves. Sessile Flower.

the body to which it belongs, without a support; as a *sessile leaf*, which issues directly from the main stem or branch, without a footstalk.

SESSION, n. *sĕsh'ŭn* [F. *session*—from L. *sessĭō* or *sessĭōnem*, a sitting—from *sedērĕ*, *sessum*, to sit. It. *sessione*]: a sitting; the actual sitting of a court, council, legislature, etc., for transaction of business; actual time during which they sit or meet, with only short adjournments: in *Eng.*, the period of time between the meeting of parliament and its prorogation: in *Scot.*, the lowest ecclesiastical court of a Presb. church. SESSION-CLERK, in *Scot.*, one who officially keeps the books and documents of a session, makes all entries, and manages the proclamations of banns for marriages. SES'SIONAL, a. *ăl*, pertaining to a session or sitting, particularly of an ecclesiastical court. COURT OF SESSION (q.v.), in *Scot.*, the supreme civil court. QUARTER SESSIONS: see QUARTER SESSIONS: JUSTICE OF THE PEACE.

SESSPOOL, n. *sĕs'pôl:* see CESSPOOL.

SESTALIT, *sĕs'ta-lĭt:* name given to a patent fuel consisting of small porous cubes, to be consumed in portable or small stationary stoves. It is used for heating small apartments, for keeping warm the feet of persons riding in a carriage in cold weather, etc. It emits no odor, no smoke. The material is set on fire by means of an alcohol flame.

SESTERCE, n. *sĕs'tĕrs*, or SESTER'TIUS [F. *sesterce*—from L. *sester'tĭus*, a sesterce—from *semis*, a half; *tertius*, third; It. *sesterzio*]: in *anc. Rome*, a silver coin, the fourth part of the *Denarius* (q.v.); thus containing at first 2½ *asses* or *libræ*. The name S., abbreviation of the Latin *semis-tertius*, which was Roman mode of expressing 2½; the custom being to derive the names of all coins from the foundation of the money-system, the *As* (q.v.). The symbols for the S. were indifferently HS or IIS, the former only a modification of the latter, which expresses two units, and S. for the additional half-unit (*semis*). In the Latin classics, this coin is denoted often by *sestertius-nummus*, or merely *nummus*. When the *Denarius* (q.v.) was made to contain 16 *asses*, the relation between it and the S.

was preserved: and the S. from that time contained 4 *asses*, though the name, no longer significant, was preserved. Till the time of Augustus, when the relation of the denarius to the *as* was changed, the S. was worth about $4\frac{1}{10}$ cents; but after this period it was reduced to a little less than 3 cents.—The sum of 1,000 sestertii was called *sestertium* (after Augustus, = about $37.97), which was the 'money of account' (never a 'coin') used in the reckoning of large sums of money.

SESTET, SESTETTO: same as SEXTET, SEXTETTO.

SESTRI LEVANTE, *sĕs'trē lā-vân'tā:* seaport of n. Italy, 26 m. e.s.e. of Genoa; on a little bay near the mouth of the Gromolo. It has five foreign consulates. Its Church of the Nativity has valuable paintings. Pop. 2,300.

SESTRI PONENTE, *pō-nĕn'tā:* town of n. Italy, 4 m. w. of Genoa, on the high road along the sea-coast. There is a large govt. factory of tobacco. Pop. 9,500.

SET, a. *sĕt* [AS. *settan;* Dan. *sætte;* Ger. *setzen,* to place, to let down: Ger. *sitzen;* Icel. *sitia,* to sit: L. *siděrĕ,* to seat one's self; *sedērĕ,* to sit]: regular; formal; determined; obstinate; firm; established or fixed: N. a number or collection of things of the same kind, or of a similar form, intended to be used together; a number of things united in the formation of a whole; a complete assortment; a number of persons usually or officially united; a clique; a lot; a young plant for putting into the soil for growth; the descent of a heavenly body below the horizon: V. to put or place into any condition or state; to put, place, or fix; to assign; to predetermine; to cause to rest in a standing posture; to regulate or adjust, as a time-piece; to reduce a fracture; to adapt to music, as words; to spread, as sails; to fix in metal, as precious stones; to bring to a fine edge, as a razor; to mark game, as a dog; to sink below the horizon, as the sun; to be fixed; to change fluidity for firmness; to plant; to begin a journey—always with *out;* among *printers,* to arrange type in order; to compose. SET'TING, imp.: ADJ. falling below the horizon: N. the act of placing or fixing; the act of sinking or appearing to sink below the horizon; something inserted; that in which something, such as a precious stone, is set; the direction of a current, as of a sea or a wind; the hardening, as of cements, limes, or plasters; in *OE.,* an inclosure. SET, pt. and pp. SET'TER, n. *-tĕr,* one who sets; an inciter, with *on;* a proclaimer; a sporting-dog that indicates by sitting or crouching the place where game lies hid (see below). TO SET ABOUT, to begin; to apply one's self. TO SET AGAINST, to place in opposition. TO SET AGOING, to cause to begin to move. TO SET APART, to separate to a particular use; to reserve. TO SET A SAW, to bend every alternate tooth to one side, and the remainder to the other. TO SET ASIDE, to reject for the present; to annul. TO SET AT DEFIANCE, to defy; to dare the power and malice of an adversary or enemy. TO SET AT EASE, to quiet; to tranquillize. TO SET AT NAUGHT, to despise; to undervalue. TO SET A TRAP, SNARE, OR GIN, to place it in

a situation to catch prey; to concoct a design in order to draw into one's power. To SET BEFORE, to present to view; to offer. To SET BY, to place on one side for convenience or safety. To SET DOWN, to place upon the ground; to put in writing. To SET EYES ON, to see; to behold. To SET FORTH, to make appear; to manifest. To SET FORWARD, to begin to move on; to promote. To SET FREE, to release from confinement or bondage. To SET IN, to begin; to enter upon a particular state, as the weather. To SET IN ORDER, to adjust or arrange. To SET OFF, to decorate; to place against, as an equivalent; to start, as for a race; among *printers*, to deface or soil, as a recently printed sheet coming into contact with another not quite dry. To SET ON or UPON, to incite; to assault or attack; to fix or place. To SET ONE'S CAP AT or FOR, to endeavor to catch the attention or affections of—familiarly applied to a woman supposed to be making approaches in love to a man. To SET ONE'S SELF AGAINST, to place one's self determinedly in opposition to. To SET ON FIRE, to communicate fire to; to fill with disorder; to inflame the passions of. To SET ON FOOT, to put in motion; to start. To SET OUT, to begin a journey or course; to begin the world; to assign; to mark off; to adorn; to display; to state at large. To SET OVER, to appoint or constitute, as a superior, ruler, or commander. To SET RIGHT, to put in order; to correct. To SET SAIL, to begin a voyage. To SET VALUE ON, to esteem; to appreciate. To SET THE FASHION, to determine what shall be the fashion. To SET THE TEETH ON EDGE, to affect the teeth with a disagreeable sensation, as when an acid or a woolen cloth is brought into contact with them. To SET TO, to apply one's self; to affix. To SET UP, to found or establish; to raise; to exalt; to place on view; to utter loudly; to raise from any depressed condition; to begin, as a business; to advance, as a doctrine; to put in type. DEAD-SET, n. a fixed state or condition precluding further progress; the act of a setter-dog when it discovers game. To BE AT A DEAD-SET, to be in a fixed state or condition, precluding further progress. To MAKE A DEAD-SET UPON, to make a determined and importunate appeal to. SET or SETT OF A BURGH, in *Scots law*, the constitution of a Burgh (q.v.). SET-BACK, a flat plain set-off in a wall. SET-BOLT, an iron pin or bolt for fitting planks closely together. SET-DOWN, a rebuke that quiets or silences; a rebuff. SET-FAIR, the coat of plaster used after roughing-in, levelled and smoothed by a flat wooden instrument called a float. A SET-OFF, that which is used to improve the appearance; a decoration; a counter-claim (see below); an equivalent. A SET SPEECH, a speech carefully prepared before delivery. SET-TO, n. a conflict in boxing or argument, or the like. SETTING-COAT, the best sort of plastering used on walls or ceilings. SETTING-DOG, a dog trained to crouch at the sight or scent of game; a setter.

SETA, n. *sē'tă,* SETÆ, n. plu. *sē'tē* [L. *sēta,* a thick stiff hair]: a bristle or sharp hair; the bristle-like stalk that supports the theca, capsule, or sporangium of mosses; the awn or beard of grasses when proceeding from the extremity of a husk or glume; in *zool.*, SETÆ are the stiff, short hairs that cover many caterpillars and insects; the bristles or processes that cover the limbs and mandibles of many crustaceans. SETACEOUS, a. *sĕ-tā'shŭs,* bristly; resembling a bristle; bristle-shaped. SETIFEROUS, a. *sĕ-tĭf'ĕr-ŭs* [L. *fero,* I produce]: producing or having bristles. SETIFORM, a. *sē'tĭ-fawrm* [L. *forma,* shape]: bristle-shaped. SETIGEROUS, a. *sĕ-tĭj'ĕr-ŭs* [L. *gero,* I bear]: furnished with bristles for progressive motion; covered with bristles or with sharp processes resembling hair. SETIREME, n. *sē'tĭ-rēm* [L. *rēmus,* an oar]: one of the legs of an aquatic insect when fringed with bristles, which enable it to move on the water.

SETA'RIA. See MILLET.

SETHE. See COAL-FISH.

SETHITES, *sĕth'īts:* obscure Gnostic sect of the 2d century, allied to the Ophites (q.v.), or worshippers of the serpent (see SERPENT-WORSHIP): they belonged to that class of religionists who, in evolving what they regarded as their system, approached paganism. Accepting the Christian mode of thought and its terminology, they utterly disregarded the great facts of Scripture history, maintaining that Seth reappeared in the person of the Messiah, and affirming that they possessed books written by him. — See Neander's *Kirchengeschichte* (Bohn's translation, II. 115).

SET-OFF, in Law: claim of a defendant which he alleges to counterbalance part or all of a plaintiff's demand. At common-law set-off was not admitted as a plea, but English statutes of the 2d and 8th year of George II. allowed it, both for England and the Amer. colonies; and all the states have enacted statutes to the same effect. Set-off is allowed only where the payment of money is concerned; hence A sued by B for trespass, cannot plead a trespass by B as a set-off. Set-off is not allowed when the state is plaintiff. Again, the debt pleaded as set-off must be the individual debt of the plaintiff, not his debt as partner with C, D, etc.

SETON, n. *sē'tn* [F. *séton,* a seton—from L. *sēta,* a bristle; It. *setone*], in Surgery: artificially produced sinus or channel, through which some substance—e.g., a skein of cotton or silk, or a few horse-hairs is passed so as to excite suppuration, and to keep the artificially formed openings patent; also, the material so inserted; also, the sinus so produced. The use of setons is much less common now than it was formerly. They were established in the subcutaneous tissue of the body (1) as counter-irritants, or (2) to act as a drain on the system at large, or (3) to excite inflammation and adhesion. For counter-

irritation, setons were inserted usually in the neighborhood of the affected parts; but for action as a drain on the system at large—e.g., in threatened head-affections—the nape of the neck was the part always selected. The operation is very simple. A longitudinal fold of skin over the spines of the cervical vertebræ is raised by the fingers from the deeper structures, and is transfixed by the seton-needle rather obliquely, so that one of the openings shall be rather more dependent than the other. The needle must pass somewhat deeply through the subcutaneous tissue, as, if it passed immediately beneath the skin, the latter would probably slough over the whole track of the wound The inserted material should be smeared with oil, and may be allowed to remain undisturbed for four or five days, till there is free discharge of matter, after which a fresh portion should be drawn daily through the wound.

For exciting local inflammation and the adhesion which is its result, setons are employed in treatment of hydrocele, enlarged bursæ, ranula, bronchocele, ununited fractures, etc. In the two last cases, their use is not without danger.

The word *seton* is from the Latin *seta,* a hair, because hairs were originally employed as the inserted material. Indeed, at the present day, it is the custom of many of the nomadic tribes of central Asia to insert a hair into the heels of their prisoners, which lames them to such an extent as to prevent their escape.

SETON, *sē'ton,* ELIZABETH ANN (BAYLEY): founder of the Sisters of Charity congregation in the United States: 1774, Aug. 28—1821, Jan. 4; b. New York; dau. of Richard Bayley, M.D. With her husband William S., and her children, she visited Italy 1803, and there her husband died. Returning to the United States, she was received into the Roman Catholic Church. To support herself and 5 children she opened a school in New York, but it was unsuccessful. Then an opportunity was afforded her for executing a project that she had meditated, of founding a congregation of women for works of mercy to orphans and destitute children. A farm having been purchased near Emmittsburg, Md., Mrs. Seton, with three companions moved thither and founded a new order of charity. Soon the establishment comprised a residence for the members of the congregation ('sisters'), a novice-house, a boarding-school for girls, a day-school for poor children, and an orphan asylum. The first colony of sisters was sent to Philadelphia (1814); then colonies were sent to different the 'mother-house,' and the seat of government of the order. At the death of Mother Seton there were 20 communities of her congregation conducting schools, orphanages and hospitals in Md., Penn., N. Y., Mass., Del., O., Va., Mo., La., and D. C. See her *Memoirs* (1817): and *Life of Mrs. Seton,* by Chas. J. White, D.D., (7th ed., 1872).

SETON, Ernest Thompson: American author, for some time known as Seton-Thompson: b. South Shields, Durham, England, 1860, Aug. 14. After a brief course at the Royal Academy, London, he spent three years in zoological study on the Assiniboine in Manitoba, published works on the *Birds of Manitoba* and *Mammals of Manitoba,* was made government naturalist of the province, and executed for the *Century Dictionary* more than 1,000 drawings of animals and birds. In 1890 he became a pupil of Mosier in Paris, whither he returned in 1894 to study with Ferrier, Bougereau, and Gérôme. He exhibited at the salon several drawings and paintings of wolves, his particular subjects. He has published several works which, while generally recognized as of excellent quality from a strictly literary viewpoint, have been criticized from that of natural history. Among these much-read books are: *Wild Animals I Have Known* (1898); *The Trail of the Sandhill Stag* (1899); *The Biography of a Grizzly* (1900); *Lives of the Hunted* (1901); and *Woodmyth and Fable* (1904).

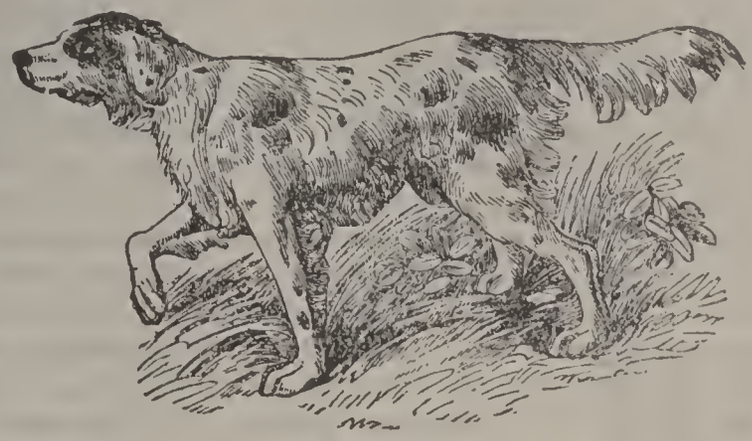
SETON HALL COLLEGE: Roman Catholic educational institution at South Orange, N. J.; founded (1856) by James Roosevelt Bayley, then bishop of Newark, later archbishop of Baltimore; named in honor of his aunt, Mother Seton (see Seton, Elizabeth Ann). Originally established at Madison, N. J., the college was removed to South Orange in 1860. In 1865 it was enlarged. A year later destroyed by fire, it was rebuilt and reopened in 1867. The college and grounds occupy 75 acres, with 9 buildings. Classical and scientific studies are included, with degrees of B.A. and B.S. Lectures are given. Three full scholarships are offered in the classical course by competition. These include board and tuition until graduation. The staff now consists of 25 professors, and tutors, and 200 students. The library contains 40,000 volumes. One of the dormitories was destroyed by fire 1909, March 28.

SETOSE, *sē'tōs,* or Se'tous, a. *-tŭs* [L. *sētōsus,* bristly—from *sēta,* a bristle]: in *bot.,* covered or set with bristles.

SETTEE, n. *sĕt-tē'* [from Set]: a long seat with a back to it; a vessel with a long sharp prow and two or three masts, carrying lateen sails, common in the Mediterranean.

SETTER, *sĕt'tĕr:* kind of dog named from its habit of *setting* or crouching when it scents game, instead of standing, like the pointer. It is supposed to have its origin from a mixture of the pointer and the spaniel. It is larger than the spaniel; its hair is less smooth than that of the pointer, and has the waved character of the spaniel's. The tail is bushy. There are several breeds. The general color of the *English Setter* is a white ground, with large spots or blotches of liver-color or red. The *Irish Setter* has large legs in proportion to the size of

the body. The *Scotch* or *Gordon S.* is of rich black-and-tan color. The *Russian S.* is covered with woolly fur, much matted. Each of these breeds has its peculiar merits. All setters have the soles of the feet well covered with hair, so that they can bear hard work on rough ground. They



English Setter

soon become exhausted, however, unless they have access to water. The S. is much employed by sportsmen. It is one of the most affectionate, gentle, and intelligent of dogs.

SETTER, SETTING: see under SET.

SETTLE, n. *sĕt'l* [AS. *setl*, a seat (see SET)]: a long seat or bench with a high back; a stool.

SETTLE, v. *sĕt'l* [AS. *setl*, a seat or setting; *setlan*, to fix: Icel. *sætt;* AS. *saht*, agreement, peace (see also SET)] to make permanent; to fix or establish in business, or in any way of life; not to suffer to continue doubtful in opinion or wavering in conduct; to establish; to confirm; to make close or compact; to tranquillize; to fix by gift or legal act, as an annuity; to colonize; to establish or ordain over a church or parish; to close by amicable agreement or otherwise, as a dispute; to balance or pay, as an account to sink or fall to the bottom, as dregs or impurities; to become stationary or permanent; to quit an irregular for a methodical or regular life; to fix one's dwelling; to grow or become calm after agitation; to marry and establish a home; to sink by its own weight, as a building; to subside; to rest or repose. SETTLING, imp. *sĕt'lĭng:* N. the act of making a settlement; a colonizing; act of subsiding; an adjustment of difference. SET'TLINGS, n. plu. *-lĭngz*, the sediment which falls to the bottom of a liquid; dregs. SETTLED, pp. *sĕt'ld:* ADJ. fixed; stable. SETTLER, n. *sĕt'lĕr*, one who inhabits a new country; a colonist; *familiarly*, a decisive stroke. SETTLEMENT, n. *sĕt'l-mĕnt*, act of settling, or state of being settled: jointure granted to a wife; act of entering into a domestic state or marrying; act of planting, as a colony; the colony itself: right to parochial relief, or the residence by which it is claimed (see POOR—POOR-LAWS): liquidation or payment; conveyance of property real or personal, for certain purposes; mutual arrangement between living persons for regulating

the present or future possession or use of property; in particular, conveyance to a married woman or to a woman in view of marriage (or to trustees in her behalf), of property for her own benefit during life, and that of her husband or children, or both, after her demise. In the United States, settlements at marriage are not common. If, after marriage, the husband settles a property on the wife and children, the settlement is valid, and the property cannot be attached by the husband's creditors, if, at the time of making it, he was not indebted. *Settlement* denotes also adjustment, as of differences or a claim; in *Scot.*, act of ordaining and placing a minister in a parish. SET'TLEMENTS, n. plu. *-mĕnts*, in *arch.*, those parts in a building in which defects by sinking have occurred; places where colonies are established, or the colonies themselves, as *British Settlements*. SETTLED ESTATE, estate held by some tenant for life, under conditions defined in the deed. To SETTLE ON or UPON, to confer upon by permanent grant; to assure to. SETTLING-DAY, a day on which accounts are balanced and settled, as on the stock exchange; the prompt-day in the produce-market. ACT OF SETTLEMENT, in *Eng. hist.*, the act of 1702, by which the crown was limited to the house of the present ruler.—SYN. of 'settle': to place; fix; establish; confirm; determine; affirm; compose; subside; sink; deposit; rest; repose; regulate; adjust.

SETTLE, *sĕt'tl*, ELKANAH: minor Eng. playwright and poet: 1648-1723; b. Dunstable. After studying a while at Trinity College, Oxford, he went to London, to seek subsistence by literature. In 1671, he made something of a hit by his tragedy *Cambyses;* and the Earl of Rochester and others, wishing to annoy the great Dryden, loudly hailed in S. the superior genius of the two. Through the influence of Rochester, to his next tragedy, *The Empress of Moroceo*, the unwonted honor was accorded of being played at Whitehall by the lords and ladies of the court, and in this way a great run was secured for it before the general public. In the insolence of success, the author printed with it a Preface, in which Dryden was severely assailed. This quarrel is all that keeps S. in remembrance: in the great satire, *Absalom and Achitophel*, Dryden scourged him with his scorn, so that he survives for us as a shrieking ghost. Having no real talent, he speedily relapsed into obscurity. The sometime rival of Dryden was fain to eke out a subsistence by writing verses for city pageants and festivities, and pieces to be acted in the booths of Bartholomew's Fair. In his destitute age, he was admitted to the Charter-house, where he died.

SETTLOR, n. *sĕt'lĕr* [see SETTLE 2]: in *law*, a person who settles estates, either heritable or movable, by will or marriage contract, or, in Scotland, by disposition *mortis causâ*='for the cause of death'—that is, which will only take effect after death.

SETUBAL, *sā-tō'bâl* (frequently and erroneously called by the English ST. UBE'S): important seaport city of Portugal, province of Estremadura, 20 m. s.e. of Lisbon, on the north side of the Bay of S., which forms a magnificent harbor, though its entrance is obstructed by sand-banks. The harbor is furnished with a light house and with broad and handsome quays, and is protected by five forts; but the valley in which the town stands is completely commanded by neighboring heights. The town owes its importance chiefly to its trade in the muscadel and white wines, in sea-salt, oranges, lemons, and cork bark; there is also an active fishing industry. S. is the old Roman *Cetobriga*. In 1755, it suffered severely from an earthquake.—Pop. 17,000.

SETULIFORM, a. *sē-tū'lĭ-fawrm* [L. *sētŭla*, a little bristle—from *sēta*, a bristle; *forma*, shape]: in *bot.*, thread-like. SETULOSE, a. *sēt-ū-lōs'*, resembling a little bristle.

SEVASTO'POL; see SEBASTOPOL.

SEVEN, n. *sĕv'n* [AS. *seofon;* Goth. *sibun;* Dan. *syv;* Gael. *seachd;* L. *septem;* Skr. *saptan*, seven]: six units and one more (see below): ADJ. being or having seven. SEVENTH, a. *sĕv'nth*, following the sixth; being one of seven equal parts into which a whole can be divided: N. that which follows the sixth; one of the seven equal divisions of a whole; one part in seven (see SEVEN, below): in *music*, an interval which is a semitone less than an octave—called a *major seventh*. SEV'ENTHLY, ad. *-lĭ*, in the seventh place. SEV'ENTY, a. n. *-n-tĭ*, seven times ten. SEV'ENTIETH, a. *-tĭ-ĕth*, the ordinal of seventy: N. one of seventy equal parts; one part in seventy; that which follows the sixty-ninth. MINOR SEVENTH, in *music*, an interval of four tones and two major semitones. DEFECTIVE or DIMINISHED SEVENTH, an interval consisting of three tones and three major semitones. SEV'ENFOLD, a. *-fōld* [*seven*, and *fold*]: repeated seven times. SEVENNIGHT, *sĕn'nīt* or *-nĭt* [*seven*, and *night*]: a period of seven days and seven nights; a week; now contracted into *se'nnight* or *sennight*. SEV'ENTEEN, a. *-tēn* [*seven*, and *ten*]: seven and ten. SEV'ENTEENTH, a. n. *-tēnth*, the ordinal of seventeen; the seventh after the tenth; one part of seventeen.

SEV'EN: frequently used as a mystical and symbolical number, also simply as a round number in the Bible, as well as among the principal nations of antiquity (Persians, Indians, Egyptians, Greeks, Romans, etc.). The reason for the preference of this number for sacred use has been found in its consisting of *three*—the number of the sides of a triangle—and *four*—the sides of a square, these being the simplest rectilineal figures:—or in other equally vague circumstances. The real reason, however, seems to be astronomical, viz., the observation of the 7 planets and the phases of the moon—changing every 7th day. (See WEEK.) As instances of the use of the number seven in the Old Test., we find the Creation completed in 7 days, wherefore the seventh day was kept sacred; every 7th year was Sabbatical, and the 7 times 7th year ushered in the Jobel-year

or year of Jubilee. The three *Regalim,* or pilgrim festivals (Passah, Festival of Weeks, and Tabernacles), lasted 7 days; and between the first and second of these Feasts were counted 7 weeks. The first day of the 7th month was a 'Holy Convocation.' The Levitical purifications lasted 7 days, and the same space of time was allotted to the celebration of weddings and the mourning for the dead. In innumerable instances in the Old Test. and later Jewish writings, 7 is used as a kind of round number. In the New Test. we find in the Apocalypse the churches, candlesticks, stars, trumpets, spirits, all to the number of 7, and the 7 horns, and 7 eyes of the Lamb. The same number appears again either divided into half (3½ years, Rev. xiii. 5; xi. 3; xii. 6; etc.), or multiplied by ten—70 Israelites go to Egypt, the exile lasts 70 years, there are 70 elders, and at a later period there are supposed to be 70 languages and 70 nations upon earth. To go back to the earlier documents, we find in a similar way the dove sent out the second time 7 days after her first mission, Pharaoh's dream shows him twice 7 kine, twice 7 ears of corn, etc. Among the Greeks the seven was sacred to Apollo and to Dionysos, who, according to Orphic legends, was torn into 7 pieces; and it was particularly sacred in Eubœa, where the number pervaded almost every sacred, private, or domestic relation. Many ancient speculations connected the number seven with the human body and the phases of its gradual development and formation, its critical periods of sicknesses—partly still extant as superstitious notions. The Pythagoreans made much of this number, giving it the name Athene, Hermes, Hephaistos, Heracles, the Virgin unbegotten and unbegetting (i.e., not to be obtained by multiplication), Dionysos, Rex, etc. The 'seven sacraments,' the 'seven Free Arts,' the 'seven wise men,' and many more instances show the importance attached to this number. It had a great part in the superstitions of the middle ages.

SEVEN CHURCHES OF ASIA: churches established in Asia Minor, by the apostles: Ephesus, Smyrna, Pergamos, Thyatira, Sardis, Philadelphia, and Laodicea.

SEVEN DAYS' BATTLES, The: see (Battles of) Mechanicsville: Gaines's Mill: Savage's Station: Frazier's Farm: Malvern Hill: also Chickahominy.

SEVEN DEADLY SINS, in Rom. Cath. Theol.: Pride, Covetousness, Lust, Gluttony, Anger, Envy, Sloth.

SEVEN DO'LORS OF THE BLESSED VIRGIN MARY, Feast of the: modern festival of the Rom. Cath. Church, instituted by Pope Benedict XIII. 1725; which, though bearing the name of devotion to the Virgin Mary, in reality regards those incidents in the life and passion of Christ with which his mother is most closely associated: it is celebrated on the Friday preceding Palm Sunday (q.v.). The 'dolors' or sorrows of the Blessed Virgin have long been a favorite theme of Rom. Cath. devotion, of which the pathetic *Stabat Mater Dolorosa* is the best-known and most popular expression; and the festival

of the Seven Dolors is intended to individualize the incidents of her sorrows for meditation. The seven incidents referred to under the title of 'dolors' are: 1. The prediction of Simeon (Luke ii. 34); 2. The flight into Egypt; 3. The loss of Jesus in Jerusalem; 4. The sight of Jesus bearing his cross toward Calvary; 5. The sight of Jesus upon the cross; 6. The piercing of his side with a lance; 7. His burial.

SEVEN GIFTS OF THE HOLY GHOST, in Rom. Cath. Theol.: Wisdom, Understanding, Counsel, Fortitude, Knowledge, Piety, and the Fear of the Lord.

SEVEN PINES, BATTLE OF: engagement in Henrico co., Va., 1862, May 31 and June 1. In advancing from Yorktown toward Richmond, the Union army under Gen. McClellan reached the Chickahominy river soon after the middle of May. Within a few weeks of this time, several battles were fought in this vicinity, and one occurred about two years later. (See CHICKAHOMINY, BATTLES OF.) The left wing crossed the river May 20, felled timber, constructed rifle-pits, and prepared for attack. The battle known as Seven Pines, or Fair Oaks (one part of the force being at the former, and another at the latter point), began on the afternoon of May 31. The Union forces were commanded by Gens. Keyes and Heintzelman, and the Confederates by Gen. J. E. Johnston. The Confederates made the attack about 1 P.M. and forced back the Union troops. During the afternoon the latter were reinforced by a corps led by Gen. Sumner. Toward night Gen. Johnston was severely wounded, and the command of his troops was taken by Gen. G. W. Smith. Early the next morning the fighting was renewed. The Union troops soon regained the positions that they had lost the preceding day, and in a few hours the Confederate force was put to flight, leaving large stores of arms and ammunition. Gens. Heintzelman and Sumner desired to follow the retreating force to Richmond, which was only four or five m. distant, and could have been easily taken; but Gen. McClellan, though he had about 35,000 troops in reserve, did not take advantage of the situation. The battle was bravely fought on both sides. The Union loss in killed, wounded, and missing was nearly 6,000, and the Confederate loss about 8,000.

SEVEN PRINCIPAL VIRTUES, in Rom. Cath. Theol.: Faith, Hope, Charity, Prudence, Justice, Fortitude, Temperance. The first three are called also Theological Virtues, the other four are known as the Cardinal Virtues.

SEVEN SLEEPERS OF EPH'ESUS: heroes of a celebrated legend, related first by Gregory of Tours in the close of the 6th c. (*De Gloria Martyrum*, c. 95), but of date assigned to the 3d c. and to the persecution of the Christians under Decius. According to the narrative, during the flight of the Christians from the persecution, seven Christians of Ephesus took refuge in a cave near the city, where they were discovered by their pursuers, who walled up the entrance, to starve them to death. A miracle, however, was interposed on their behalf: they fell into a preternat

ural sleep, in which they lay nearly 200 years. The concealment is supposed to have taken place 250 or 251; and it was not till the reign of Theodosius, 447, that they were reanimated. On awaking, they imagined that their sleep had been but of a single night; and on one of the party (supposing the persecution still in progress) going with caution into the city to purchase provisions privately, he was amazed to find erected in triumph, on the churches and other buildings, a cross, which, as it seemed, but a few hours before, he had seen the object of contempt and blasphemy. When he tendered at a baker's shop a coin of the time of Decius, their wonderful history became known, and they were conducted in triumphant procession into the city of Ephesus; but, according to one of various endings of the legend, they all fell asleep again at the same moment. The legend reappears with variations at later periods of Christian history.

SEVEN STARS: the Pleiades.

SEVENTEEN-YEAR LOCUST. See CICADA (*C. Septemdecim*).

SEVENTH-DAY AD'VENTISTS: one of several divergent branches of the followers of William Miller (q.v.). It originated 1844; and since 1855 has had the chief centre of its organization at Battle Creek, Mich. The Seventh-Day Adventists mostly believe that the prophetic 'cleansing of the tabernacle,' preceding the future personal advent of Jesus Christ, is of undetermined duration, and began about 1844. They advocate the seventh day as the Sabbath; baptism by immersion; the non-immortality of man; the final literal destruction of the wicked, after an intermediate state of sleep common to all, the righteous only receiving the gift of eternal life. In other respects they agree with the evangelical churches, but call the Bible their creed, and refer inquirers to such of their books as Uriah Smith's *Synopsis of Present Truth.* Their polity is congregational and independent. The Seventh-Day Adventists believe that the gift of prophecy still exists, and was accorded to Mrs. Ellen G. White; that the United States is the Two-Horned Beast; that 1843 was a real fulfillment of prophecy, namely, the 'cleansing of the sanctuary' and the beginning of the 'investigative judgment'; and that total abstinence, vegetarianism, and hygiene are part of religion. Its members are spread throughout the United States, being especially strong in the West, and numerous in other countries as well as America, having a missionary society active in all parts of the globe. It has seven publishing houses, in America, Europe, and Australia, and sanitariums and seminaries in a number of states. Its members are spread throughout the Atlantic states. Four camp-meetings are held each year, in New England and Virginia. Home missions are supported by an adult and a juvenile society. The publishing house is

at Springfield, Mass. The principal educational institution is the Battle Creek (Mich.) Coll., founded 1874, with preparatory and collegiate departments. There are 8 colleges and academies in the United States, 1 in Europe, 1 in s. Africa, and 1 in Australia, besides numerous church and industrial schools in different parts of the world. The leading church papers are the *Advent Review and Sabbath Herald,* Battle Creek; and the *Signs of the Times,* Oakland, Cal. In 1908 there were in the U. S. 1,750 churches, 488 ministers, and 64,332 communicants.

SEVENTH-DAY BAPTISTS. See BAPTISTS, SEVENTH-DAY; SABBATH.

SEV'ENTY, THE; or ALEXANDRINE VERSION; usually SEPTUAGINT (often denoted by LXX.): most ancient extant Gr. transl. of the Old Test. See SEPTUAGINT.

SEVEN WEEKS' WAR: the great conflict in 1866 for German supremacy, between Prussia and Italy on one side and Austria on the other, in which the two allied nations were victorious.

SEVEN WISE MASTERS: title of a mediæval collection of tales, important from its contents and its popularity. The idea of the work is as follows: A certain prince's son, instructed in all kinds of wisdom by seven sages, finds, from an examination of the stars, on his return to his father's court, that he is in danger of losing his life if he speaks a word within seven days. A revengeful woman endeavors to persuade his father to put him to death, each day relating an artful story with that wicked purpose, but its effect was daily neutralized by a rival narrative told by each of the sages. At the end of the seven days, the prince himself was enabled to disclose the base design.—The work is undoubtedly of oriental though unascertained origin. Some have thought to trace it in Arabic as a translation from Indian sources before the 10th century. Nearest to the original form appears to stand the *Eight Nights* of Nakhschebi, Persian adaptation of the Indian *Tutiname* (Brockhaus, Leip. 1845). It passed into the literature of w. Europe in the 11th or 12th centuries, through two redactions, a Hebrew and a Greek; and spread through Christendom, under all sorts of names, and with all sorts of modifications, in verse and in prose.

SEVEN WISE MEN: collective designation of a number of Greek sages, who lived about B.C. 620-548, and applied themselves to the cultivation of practical wisdom. Their moral and social experience was embodied in brief aphorisms in verse and in prose. The names of the Seven, as usually given, are Solon (q.v.), Thales (q.v.), Pittacus (q.v.), Bias (q.v.), Chilon, Cleobulus, and Periander of Corinth; but there is not unanimity among the ancients either as regards the names, the number, the history, or the sayings of these famous sages.

SEVEN WONDERS OF THE WORLD, in Ancient Times: the Pyramids of Egypt, the Hanging Gardens of Semiramis at Babylon, the Temple of Diana at Ephesus, the Statue of Jupiter at Athens by Phidias, the Mausoleum (q.v.), the Colossus (q.v.) at Rhodes, and the Pharos of Alexandria. This cycle of seven wonders originated among the Greeks after the time of Alexander the Great, and were described in a special work by Philo of Byzantium, which has been edited by Orelli.

SEVEN YEARS' WAR, The: the third, last, and by far the longest (1756–63) and most terrible of the contests for the possession of Silesia (q.v.). During the two former wars, Empress Maria Theresa of Austria had too much other work on hand in maintaining her claims to the Austrian dominions (see Succession, War of Austrian) to offer very effective resistance to the aggression of Frederick the Great of Prussia; but after her triumph in the Austrian contest, she renewed the struggle for Silesia, which had been snatched from her at the moment of her greatest straits. She found Czarina Elizabeth, the King of Poland and Elector of Saxony, and Louis XV. of France (or rather Madame de Pompadour), ready for an offensive and defensive treaty with her. On the other hand, Britain (then at war with France) engaged to assist Prussia with an army in Hanover, and with subsidies when necessary. Frederick, resolving to anticipate his enemies, and secure a safe basis for future operations, made a sudden advance (1756, Aug.) on Dresden with 60,000 men, took possession of the country, which he governed from this time with slight intervals to the end of the war, and cooped up the Saxon army, 18,000 strong, between Pirna and Königstein. The Austrians under Browne, advancing to relieve their allies, were met by Frederick at Lobositz (Oct. 1), and after an indecisive contest, retreated. The Saxons then surrendered (Oct. 14), and were mostly incorporated with the Prussian army, which went into winter-quarters in Saxony and Silesia.—The *second campaign* (1757) began with the addition of Sweden (subsidized by France) as a fourth in the Austrian coalition, in order to recover Pomerania; and the German Reich or Empire raised an army of 33,000, to assist Austria. A combined attack was made by a French army (100,000) on Hanover; another French army (30,000) on Hesse-Cassel (ally of Prussia), with a view to reach Saxony; an Austrian army from Bohemia on Saxony and another on Silesia, both of them at first united under Marshal Daun, but (1760) separated under Daun and Loudon; the Russians (100,000) on the e. and n.e.; and the Swedes (22,000) in Pomerania; while the imperial army sometimes joined the s. French, and sometimes the w. Austrian armies. To oppose these armies, numbering in all 430,000, Frederick had the combined British-Hanoverian-Hessian army (60,000) in Hanover, and a Prussian army of 200,000, distributed over the various points attacked; but he relied much on the rapidity of his movements, and the completeness of his plans. In April, Frederick, leaving a corps of 24,000 under Lewald to resist the Swedes

and Russians, invaded Bohemia, drove in the advanced corps of the Austrians upon their main army, which he then completely routed at Prague (May 6), with a loss on his side of 18,000, and of 19,000 on the part of the Austrians: Marshals Schwerin (Prussian) and Browne (Austrian) fell in this conflict. Frederick immediately invested Prague, to which Prince Charles of Lorraine, with 46,000 men, had retreated; but Daun, who advanced from Moravia to its relief, inflicted on the Prussians a crushing defeat at Kolin (June 18), and forced them to retire from Bohemia. The n. French army had meanwhile, under Marshal d'Estrees, advanced into Hanover, defeated the incapable Duke of Cumberland at Hastenbeck (July 26), and compelled him to capitulate, on condition that the whole of his army, except the Hanoverians, should be disbanded. But the British govt. refused to ratify this shameful treaty, and speedily raised another army of similar composition, which was placed under Duke Ferdinand of Brunswick, who drove back the French, and proved himself so capable to hold them in check that Frederick ceased to have apprehensions from this quarter. The s. French army under Soubise had also advanced in conjunction with the imperialists under the Prince of Hildburghausen in the direction of Saxony, but Frederick, contesting this valuable vantage-ground, fell upon them at Rossbach (q.v.) (Nov. 5), and put them to rout. During his absence, however, the Austrians had broken into Silesia, defeated his armies, and compelled them to retire; so, compelled to utmost speed in returning, he collected a small army, defeated a thrice as numerous force of Austrians under Prince Charles of Lorraine at Leuthen (Dec. 5), and recovered Silesia. On the e., the Russians had appeared in great force, captured Memel, committing horrible devastations, and had routed Lewald at Grossjägerndorf (Aug. 30), when the change of Russian policy due to the illness and apparently impending demise of the czarina, caused them to relinquish almost all their conquests; Lewald then attacked and defeated the Swedes, driving them under the walls of Stralsund. Thus closed the second campaign, leaving matters much as at the commencement.—Duke Ferdinand opened the *third campaign* (1758) by driving the French from Lower Saxony, pursued them across the Rhine, and defeated them near Krefeld (June 23); but Contades, the new French commander, having obtained the co-operation of Soubise, compelled him to retrace his steps, till, receiving a reinforcement of 12,000 British, Ferdinand again advanced, throwing Contades between the Rhine and Meuse, and Soubise between the Rhine and Main. Meanwhile, Frederick had not been idle, for after being driven out of Moravia (which he had invaded in spring) by Daun, he marched n. with a portion of his army to meet the Russians, who—the czarina having recovered—had again invaded Brandenburg; and defeated them in a desperate battle at Zorndorf (Aug. 25), compelling them to retreat into Poland. Frederick's presence was next needed in Saxony, where his brother, Prince Henry, was hard pressed by Daun with superior

forces; but on his arrival the Austrians retreated e. till Oct. 14, when Daun turned, took Frederick completely by surprise, and gave him a severe defeat at Hochkirch (q.v.), though before the end of the year the Prussians were again in possession of Saxony. Thus passed another campaign with a slight advantage to the Prussians.—The *fourth campaign* (1759), though signalized by only two great actions, was unfortunate for Prussia. The French under Soubise had captured Frankfurt during the winter, and the Duke of Brunswick, attempting to recover it, was defeated at Bergen (Apr. 13), by Broglie (successor of Soubise), and compelled to resign the whole of Hesse to the French; but his signal victory at Minden (Aug. 1) over Contades and Broglie, and that of his relative, the hereditary Prince of Brunswick, at Gohfeld on the same day, recovered most of Westphalia, and drove the s. French beyond the Lahn and Rhine. But in the Saxon district, though Prince Henry invaded Bohemia (Apr.), capturing immense supplies, and cleared Franconia (May) of Austrians and imperialists, he subsequently evacuated Saxony, which was then occupied by the imperialists, and Loudon's Austrians advanced into Lusatia. In Silesia, Fouqué gallantly kept the Austrians at bay; and Dohna continued to coop up the Swedes about Stralsund, keeping at the same time an eye on the Russians; but the latter soon gathered in such force that he was compelled to retreat. His successor, Wedel, attempting to bar their advance, was routed near Züllichau (July 23); and though Frederick hastened to his assistance, attacked them at Kunersdorf (q.v.) (Aug. 12), and had almost gained the day, the arrival of Marshal Loudon with an Austrian force turned the tide, and converted this almost victory into the most signal defeat of the Prussians during the whole war. On the following morning, he could hardly muster 5,000 men; but, luckily, the Russians did not follow up their victory; and by perseverance, the Prussian monarch succeeded in raising another army 28,000 strong. Though it seemed almost impossible for him to prevent the meditated junction of the Russians and Austrians in Brandenburg; yet, by skilful maneuvering, he succeeded in compelling the Russians to retire to Poland; and Prince Henry, by cutting off supplies, forced the Austrians into Saxony. Nov. 21, however, he suffered a severe blow in the capture of Finck with 11,000 Prussians, at Maxen in Saxony. With greatly diminished strength, an exhausted treasury (supplied chiefly by the English subsidy, the taxes of Saxony, and forced contributions on Mecklenburg, Saxony, and Anhalt), a desolated territory incapable of affording either men or supplies, and gloomy forebodings of the final issue, though with unfaltering resolution never to yield, Frederick prepared for his *fifth campaign* (1760). —His army in Prussia, now reduced to 90,000, mostly foreigners and raw recruits, was still further diminished by the capture of Fouqué with 8,000 men in Silesia, followed by Marshal Loudon's conquest of that province, though the brilliant victory of Liegnitz (Aug. 15) subsequently restored to Frederick the n.w. division of it; he

then joined his brother, Prince Henry, drove the Russians across the Oder, and Daun into Bohemia; but his strength was now becoming glaringly insufficient for the task to which he had set himself; the Russians and Austrians captured and plundered Berlin (Oct. 3); the Swedes came down from the north, and Loudon's Austrians upward through Silesia, so that he was fairly in the toils. But, like a lion in the midst of the hunters, he turned on his most able and pertinacious adversary, Daun, terribly routed him at Torgau (Nov. 3), in Saxony, then drove Loudon into Glatz, and frightened away the Russians to Poland, and the Swedes to Stralsund. In the w., the fortune of Prussia was in the ascendant, and the French, defeated by Prince Charles of Brunswick at Einsdorf (July 13), and by Duke Ferdinand at Marburg (July 31), were again confined to Hesse.—The *sixth campaign* (1761) on the Rhine began more auspiciously for Frederick, as the French were driven in detail from their strongholds, lost their supplies by capture, suffered defeat by the Hanoverians at Langensalza (Feb. 14), and by Duke Ferdinand at Villingshausen (July 15), though in the end Broglie and Soubise again gained possession of Hesse. In Silesia, Frederick attempted to bar the progress of the Austrians, so as to prevent their junction with the Russians and so opposing 130,000 men to his poor remnant of 50,000; but in vain; however, their junction was productive of no ill results to him, for scarcity of provisions speedily compelled the Russians to retreat to Poland, after which Loudon retired to Upper Silesia, capturing Schweidnitz with 3,700 men on his way. In Saxony, Prince Henry had to retreat before Daun, and the Prussians were ejected from Pomerania by the Russians and Swedes, all subsidies from Britain stopped by the Earl of Bute after George II.'s death, and the country ravaged in all directions; so that Prussia was almost at its last gasp. Frederick's assailants had cooped him up within s. Brandenburg and n.w. Silesia; and though he was as resolute as ever to fight on, it seemed that another campaign must bring him to ruin. But the death of the czarina 1762, Jan. 5, converted the most powerful of his enemies into a fast friend; Sweden, which had suffered uninterrupted reverses during the whole war, also retired from the alliance—and the *seventh campaign* (1762) began on equal terms, as Austria and France were almost as much exhausted as Prussia. On the refusal of Austria to submit her cause to arbitration, Czar Peter III. joined his army to that of Frederick; but his successor, Catharine II., ordered the return of the army, though her strict neutrality was itself an immense benefit. Frederick had now no fears for the result, nor had he reason for fears; for July 21 he drove an Austrian force from its intrenchments at Burkersdorf, and following up his success, routed Daun at Reichenbach (Aug. 16), and took Schweidnitz (Oct. 9); while Prince Henry, by a series of fortunate maneuvers, possessed himself of the passes of the Erzgebirge, and with the valuable aid of Seidlitz, completely overthrew the other Austrian army at Freiberg (Oct. 22); and the two Brunswicks nobly sus-

tained the glory of Prussia at Wilhelmsthal (June 24) and Luternberg (July 23), capturing Cassel, and recovering the whole of Hesse. France now gave up a contest from which she had gathered nothing but exhaustion and military disgrace, and concluded treaties with Britain and Prussia; while Prussia and Austria agreed to an armistice with regard to Saxony and Silesia, of which the astute Frederick took advantage to send Kleist on a raid through Franconia and Bavaria, which had the effect of withdrawing the minor German states from the coalition. Maria Theresa was now left alone, and sorely against her will was compelled to conclude the peace of Hubertsburg, 1763, Feb. 15, which finally acknowledged Frederick the lord of Silesia. This long and desperate conflict made no change in the territorial distribution of Europe; but it increased tenfold the moral power of Prussia, and gave its army a prestige which it retained till the battle of Jena. It cost Europe a million lives, and prostrated the strength of almost all the powers who had engaged in it.—See for full account, Carlyle's *History of Frederick the Great.*

SEVER, v. *sĕv'ĕr* [F. *sevrer*, to wean—from L. *separāre*, to sever: It. *severare, sevrare*, to sunder (see SEPARATE)]: to part forcibly from the rest; to rend asunder; to divide; to keep distinct or apart; to part by cutting; to put in different orders or places; to distinguish; to make a separation. SEV'ERING, imp.: N. act of one who severs; a parting or disjunction. SEV'ERED, pp. *-ĕrd.* SEV'ERAL, a. *-ĕr-ăl* [mid. L. *separālĕ*, something separate]: separate; different; consisting of a small number; more than two, distinct; divers: N. each particular, or a small number taken singly. SEV'ERAL'ITY, n. *-ăl'ĭ-tĭ*, in *OE.*, a state of separation from the rest or from all others; distinction. SEV'ERALLY, ad. *-ăl-lĭ*, separately; distinctly; apart from others. SEVERALTY, n. *sĕv'ĕr-ăl-tĭ*, said of the lands or property which an individual holds in his own right and interest only. SEV'ERANCE, n. *-ăns*, the act of severing. A JOINT AND SEVERAL BOND OR OBLIGATION, one signed by two or more persons, each being liable to pay the whole should the others fail to do so (see JOINT AND SEVERAL).—SYN. of 'sever': to part; divide; sunder; separate; segregate; disjoin; disunite; partition; detach; disconnect.

SEVERAL: see under SEVER.

SEVERE, a. *sĕ-vēr'* [F. *sévère*—from L. *sĕvērus*, strict, severe: It. *severo*]: harsh; extremely strict or exact; apt to punish; earnest; rigid; stern; unpitying; austere; sober; sedate; intense, as cold; distressing, as pain; inclement, as the weather; searching, as a test or trial; excessive; rigidly adherent to a certain rule or standard, as applied to style in art; not employing unnecessary amplification or ornament, said of the style of a speaker or writer; close; concise. SEVERE'LY, ad. *-lĭ*, painfully; gravely; austerely; rigorously. SEVERITY, n. *sĕ-vĕr'ĭ-tĭ* [F. *sévérité*—from L. *sever'ĭtātem*]: cruel treatment; harshness; rigor; extreme strictness; extreme degree; keenness; inclemency.—SYN. of 'severe': sharp; censorious; hard; rigorous; rigid; austere;

morose; harsh; cruel; inexorable; strict; close; grave; sober; sedate; painful; afflictive; concise; stern; exact; rough; tart; acrimonious; sarcastic; satirical; cutting; biting; keen.

SEVERIANS, n. *sĕ-vēr'ĭ-anz:* in *chh. hist.*, party of Monophysites who followed the teaching of Severus, who became patriarch of Antioch 513. He asserted that the body of Jesus, prior to his resurrection, was corruptible.

SEVERN, *sĕv'ĕrn:* one of the most important and beautiful, and after the Thames the largest, of the rivers of England. It rises from a chalybeate spring on the e. side of Plinlimmon, about 11 m. w. of Llanidloes, in Montgomeryshire, N. Wales. Flowing e. to Llanidloes, to which town it retains its original British name Hafren, it afterward flows n.e. to the e. boundary of Montgomeryshire, then past Bridgenorth, and s. through Worcester and Gloucester, in which last it begins to form its estuary. It is navigable for barges to Welshpool, in Montgomeryshire, 180 m. from its mouth. Its entire length is 210 m., and it drains an area of more than 6,000 sq. m. The chief affluents are the Terne, and the Upper and Lower Avon on the e., and the Teme and Wye on the w. A canal 18½ m. long, navigable for vessels of 350 tons, extends from Gloucester to the upper portion of the estuary of the river, shortening the navigation of its lower course. The Montgomery canal extends from Welshpool to Newton, and other canals establish communication between the S. and the Thames, Trent, Mersey, and other important rivers of middle England. The *bore*, or tidal wave, which rushes up the S. with a velocity at times of 14 m. an hour, raises the water 9 ft. in height at Gloucester, below which embankments have been constructed.

SEVE'RUS, Lucius Septimius: Roman emperor (the 21st): 146, Apr. 11—211, Feb. 4 (reigned 193–211); b. near Leptis Magna, on the n. coast of Africa, of a Roman family of equestrian rank. After an excellent education, he removed to Rome, where he became pretor 178. He was subsequently commander of a legion in Gaul, and gov. of Gallia Lugdunensis, Pannonia, and other provinces. After the murder of Pertinax, he was proclaimed emperor, 193, at Carnutum, and promptly marched on Rome, where the puppet Julianus had by purchase obtained the imperial purple. His arrival before Rome was the death-signal for Julianus; and after taking vengeance on the murderers of Pertinax, converting his most formidable rival, Clodius Albinus, into an ally by creating him Cæsar, and distributing an extravagant largess to his soldiers, he marched against Pescennius Niger, and conquered him at Issus, 195. A glorious campaign in the East, and a three years' siege, followed by the capture of Byzantium, were followed by a desperate struggle with his jealous rival, Clodius Albinus, whom, after an obstinate conflict at Lyon, in which 150,000 were engaged on each side, he conquered in 197. The usual games to the degenerate citizens of Rome, and largesses to the troops, followed:

after which Severus returned to Asia, accompanied by his sons Caracalla and Geta, had brilliant success in the campaign of 198 against the Parthians, and took and plundered their cap., Ctesiphon. After a war with the Arabs, in which Severus's usual good-fortune deserted him, and a general visit to his various eastern dominions, he returned to Rome 202, and gratified the popular taste by the exhibition of shows of unparalleled magnificence, also distributing another extravagant largess to the citizens and pretorians. A rebellion in Britain drew him to that country 208; and at the head of an immense army, he marched, it is said, to the extreme north of the island, encountering enormous hardships, to which no less than 50,000 of his soldiers succumbed, and securing no permanent advantages. To secure to some extent the natives of s. Britain from the incursions of the Meatæ and Caledonians, Severus repaired or partially built the wall which bears his name, and died soon afterward at York. Severus was an able, vigorous, and just ruler, and a skilful though not great warrior; but of a cold, calculating nature, and totally devoid of high moral sentiment.

SEVE'RUS, Marcus Aurelius Alexander. See Alexander Severus.

SEVE'RUS, Wall of, as it has been erroneously called: rampart of stone which seems to have been built by Emperor Hadrian 120, between the Tyne and the Solway, on the border between England and Scotland. On the first subjugation of Britain by the Romans, a line of forts had been constructed by Agricola, extending from the Forth at Edinburgh to the Clyde at Dumbarton. Emperor Hadrian, visiting Britain 120, threw up for protection of the Roman province a wall of stone extending across the island, between the Tyne and Solway Firth. Twenty years later, Antoninus Pius, whose lieutenant, Lollius Urbicus, had gained fresh advantages over the northern tribes, endeavored to check the inroads of the Caledonians by erecting a rampart between the Forth and Clyde, connecting Agricola's line of forts. But after a vain struggle of 60 years, the Romans found it necessary to abandon the whole district between the walls, and 208 Septimius Severus repaired the wall of Hadrian, hence erroneously called the wall of Severus. Toward the close of the 4th century, Theodosius, for a brief period, reasserted the Roman dominion over the district between the walls of Antoninus and Hadrian, which, in honor of Emperor Valens, obtained the name Valentia. But this newly established province was soon lost, and it was not long before the Romans finally abandoned Britain. Many remains of the Roman walls are yet traced. See Bruce's *Handbook to the Roman Wall* (3d ed. 1885).

SEVIER, *sĕ-vēr'*, John: American pioneer: b. Rockingham co., Va., 1745, Sep. 23; d. near Fort Decatur, Ga.,

1815, Sep. 24. Having founded the town of Newmarket, Shenandoah co., Va., and there become a celebrated Indian fighter, he served as captain in the Virginia line during Lord Dunmore's War (1774). He had removed in 1772 to the Watauga colony on the western slope of the Alleghanies, and been, next to John Robertson, the most prominent of the settlers. Now, at the beginning of the Revolution, he drafted a memorial to the legislature of North Carolina, requesting annexation to that colony; and as a result all of the present Tennessee was made a county of North Carolina and known as Washington district. He served in the North Carolina legislature and was appointed district judge at Watauga. Elected colonel of the trans-Alleghany forces, he commanded in many Indian fights, distinguishing himself at Boyd's Creek (1779) and King's Mountain (1780). After the war, North Carolina found that the retention of the large section now known as Tennessee would entail obligations for a corresponding portion of the Federal debt, and therefore the tract was made over to the central government. The settlers then determined to organize an independent state and regularly apply for admission to the Union. At a convention held 1784, Aug. 23, Sevier was elected governor of the new state of Franklin, as it was called. North Carolina now recognized its mistake, and granted Watauga a superior court, besides organizing the militia troops into a brigade with Sevier as brigadier. But Sevier entered office as governor 1785, March 1, reorganized the military, established a superior court, and concluded treaties with the Cherokees. In 1787 Governor Caswall of North Carolina declared the Franklin government a revolt, subdued it by force of arms, imprisoned Sevier, and ceded the region to the Federal government. Sevier was afterward made brigadier-general of forces in the territory south of the Ohio, in 1790 elected as first representative of Congress from the Mississippi Valley, and in 1796 was elected governor of the new state of Tennessee, serving three successive terms. In 1803 he was re-elected, and again served three terms consecutively. He was chosen to Congress in 1811, and returned for a third term.

SEVIER, *sĕv-ēr′*, LAKE: lake of salt-water in Millard co., Utah, in the s.w. part of the territory, and in the Sevier desert; about 125 m. s.s.w. from Salt Lake City, about 4,600 ft. above sea-level. It varies in area, being considerably reduced in size when the air is dry and evaporation rapid, but in general is about 20 m. long and covers about 150 sq.m. There are no trees and few shrubs along its shores, and no islands in the lake. At the n. end it receives the Sevier river, its only tributary, and it has no outlet. Except on the n., it is bordered by mountains. Fish reaching the lake are killed by the brine, and devoured by gulls and other birds which are con-

stantly watching for them. Shrimps and the larvæ of insects are found in the water; and, so far as is known, this is the only animal life which it sustains. An analysis some years ago showed the water to contain, in 1,000 parts, 62·3 of chloride of sodium, 13·4 of sulphate of soda, 10·3 of chloride of magnesium, and 0·4 of sulphate of lime. The present area is only a portion of a former great lake covering most of the S. desert and discharging its waters into the Great Salt Lake; and at a still earlier time the Great Salt Lake with the S. Lake formed a body of water with width of 125 miles.

SÉVIGNÉ, *sā-vēn-yā'* (MARIE DE RABUTIN-CHANTAL, *dĕh râ-bü-tăng'-shŏng-tăl'*), Marquise DE: writer of the most charming letters on record: 1626, Feb. 6—1696, Apr. 17; b. Paris; only daughter of Baron de Chantal, Celse-Benigne de Rabutin, and of his wife, Marie de Coulange. She was left early an orphan; and at the age of six the care of her education devolved on her maternal uncle, the Abbé de Coulange, an excellent and amiable man, who conscientiously acquitted himself of his charge, and for whom through life his niece entertained tender affection. She was carefully instructed in all the knowledge which then appertained to the education of a French gentlewoman; by the eminent scholar Menage she was taught Latin, Italian, and Spanish; and M. Chapelain, another literary notability of the time, assisted in her culture. At the age of 18 (1644, Aug. 1), she was married to the Marquis Henri de S., representative of an ancient house in Brittany. The union was not happy. The marquis was 'a man of wit and pleasure,' of the type of the period; his wit he exhibited by his happy way of squandering his wife's fortune, and he took his pleasure in neglect of her, and addiction to other women. In 1651 he was killed in a duel by a Chevalier d'Albret, his rival in a love-affair. Madame de S., left with a son and daughter, now for a few years retired almost wholly from society, and devoted herself to their education. In 1654 she returned to Paris, where her beauty, her wit, her happy social tact and vivacity, concurred, with the charm of her sweet and kindly nature, to insure her unrivalled success in the brilliant society of the period. Her lovers were legion, and among them were some of the most distinguished men of whom France could then boast, as the Prince de Conti, Turenne, Fouquet, supt. of finance, and others. But they sighed in vain: all offers of marriage she steadily declined; and from any of those lighter ties there and then most leniently regarded—if not almost considered *comme il faut*—not the least spot rested on her reputation. For her virtue she must have credit as virtue, and not merely the coldness which simulates it; for she was obviously of somewhat impulsive nature. Her numerous and warm friendships, with her absolute devotion to her children, may have sufficed as food for a heart not unlikely, in lack of these, to have craved a more perilous diet. Her affection for her daughter in particular, who 1669 became Madame de Grignan, was the ruling passion

of her life; and to the separation of the mother, over long periods, from 'this infinitely dear child,' the world is indebted for much the larger share of the collection of Letters which has given fame in perpetuity to Madame de Sévigné. Madame de Grignan was a beautiful and accomplished woman; but has by many writers been criticised as willing to permit rather than to appreciate or return a deep and ardent affection. She seems to have loved her mother after her own manner. It was the one main grief of Madame de S. to be forced to live apart from her daughter. In 1696, while on a visit to the Château de Grignan, she was seized with malignant small-pox, and died at the age of 70.

The Letters of Madame de S., on which her fame securely rests, are most charming in the *abandon* and easy *naïve* frankness with which they reveal her beautiful nature. They sparkle with French *esprit*, and spontaneous gayety of heart; and their writer is probably not equalled in the delicate *finesse* with which, in a few careless, rapid words, she flings off a scrap of light narrative, dashes in a little graceful picture, or points a dramatic situation. Above all remarkable is the lightly-moved and ever-active sympathy which keeps her exquisitely *en rapport* with the interest of whatever may be passing before her. See Life by Miss Thackeray (1881).

SEVILLE, *sĕv'ĭl* or *sé-vĭl':* province in Andalusia, Spain, at one time a Moorish kingdom; surrounded by Badajoz on the n., Cordova on the e., Malaga and Cadiz on the s., and Huelva on the w.; 5,429 sq. m. Most of the s. portion is comparatively level, but in the n. are offshoots of the Sierra Morena Mts. It is watered by the Guadalquivir and several rivers tributary to it, of which the Guadalimar, Guadiaira, and Genil are largest; and is traversed by various railroads. In a large part of the province the soil is fertile and yields a variety of products, and the pastures are noted for excellence. In the elevated regions are quarries of marble and chalk, and mines of salt, lead, iron, coal, copper, and silver. Fabrics of silk and wool, earthenware, soap, glass, chocolate, paper, leather, and tobacco, also ardent spirits, are manufactured; and oranges, olives, wine, and oil are largely exported. Among the larger towns are Seville, Carmona, Ecija, Osuna, and Utera. Pop. (1887) 543,944; (1900) 555,256.

SEVILLE, *sĕv'ĭl* or *se-vil'* (Sp. *Sevilla*, *sā-vēl'yâ*, the *Hispalis* of the Romans): famous city of Spain, former cap. of the ancient kingdom, and now of the modern province of S.; on the left bank of the Guadalquivir, 94 m. by railway n.n.e. of Cadiz. The city is almost circular in shape, surrounded by Moorish walls, surmounted with 66 (formerly 166) towers, and pierced with 15 gates; and is 5 m., or, including its 10 suburbs, 10 m., in circumference. Held by the Moors for five centuries, and entirely rebuilt by them from the materials of former Roman edifices, S. was long a purely Moorish city, and the old Moorish houses, which age, in this dry climate, has done little to destroy, are still the best houses. Half of the

city still preserves its ancient character; but changes are taking place every year. The narrow tortuous streets that kept out the sun, with their wide spacious mansions, with ample courts and gardens, perfectly suited to the climate, are giving way to spacious straight streets of small, warm houses, open to the blaze of noon. The cathedral, one of the largest and finest in Spain, is an imposing edifice, of which the solemn and grandiose are the distinctive qualities. It was completed 1519; is 431 ft. long, 315 ft. wide; has 7 aisles, and an organ with 5,400 pipes. The pavement is in black and white checkered marble. The cathedral is superbly decorated. Its painted windows are among the finest in Spain, and it contains paintings by Murillo, Vargas, the Herreras, etc. Attached to the cathedral is one of the most remarkable towers in the world, called the Giralda (i.e., a weather-cock in the form of a statue), and in all 350 ft. high. This Moorish tower was built 1196, and was originally only 250 ft. high, the additional 100 ft. being the rich filigree belfry added 1568. The pinnacle is crowned by a female figure in bronze, 14 ft. high, 2,800 lbs. in weight, which veers about with the slightest breeze. From this great tower the *Muezzin* (q.v.) of Mohammedan days called the faithful to prayers. The royal residence, the Alcazar (*Al-Kasr*, house of Cæsar), contains several noble halls, and much delicate ornamentation, rivalling that of the Alhambra. The house in which Murillo lived and died is still seen here. The finest pictures in S. are in the cathedral, the Caridad, the Museo, and the university. S. contains 74 churches; but prior to the suppression of monasteries, it contained 140. Besides the univ. (of four faculties), there are many educational institutions. The city contains more than 100 squares. The Fabrica de Tabacos, a factory of snuff and cigars, employs several thousand hands, mostly women. The Plaza de Toros can accommodate more than 12,000 spectators. There is regular communication with Cadiz by river and rail. There are several royal foundries and factories for arms, and porcelain and iron and machine works. Weaving, soap-making, and other manufactures are carried on. Pop. (1887) 143,182; (1900) 148,315.

The Hispal of the Phœnicians, the Hispalis of the Romans, was corrupted by the Moors into Ishbilliah, of which it is supposed the modern name is a modification. It was a place of great importance in the later period of Roman dominion; became cap. of s. Spain during the ascendency of the Vandals and the Goths, when it was the scene of two notable church councils (590 and 619); and fell into the hands of the Moors in the 8th c., under whom it rapidly rose to splendid prosperity, and reckoned 400,000 inhabitants. In 1026 it became cap. of the Moorish kingdom ruled by the Abadides, from whom it passed 1091 to the Almoravides, and 1147 to the Almohades. In 1248 it was taken by Ferdinand III. of Castile, when 300,000 Moors left for Granada and Africa; and from this time to the removal of the court to Valladolid in the reign of Charles V., S. was cap. of Spain. The city rose to its climax of

prosperity after the discovery of the new world, when it became the residence of princely merchants, and the mart of the colonies; but its trade was afterward transferred to Cadiz. In 1810 it was taken and ravaged by Soult. It capitulated to Espartero 1843.

SEVILLE ORANGES, *sĕv'ĭl:* the bitter oranges imported into this country from *Seville*, in Spain; the *Citrus vulgārĭs*, ord. *Auran'tĭācĕæ.*

SÈVRES, *sāvr:* small town of France, dept. of Seine-et-Oise, six m. s.w. of Paris, on the Paris and Versailles railway. It is celebrated for manufacture of porcelain wares, unsurpassed for elegance of design and beauty of painting. Painted glass also is manufactured. The Porcelain Museum, which was destroyed during the war of 1870, contained a large and curious collection of articles in china and earthenware from all parts of the globe. Pop. (1896) 7,317.

SEVRES, DEUX-, *dĕh-:* inland dept. in w. France, between the depts. Vienne on the e. and Vendée on the w.; 2,315 sq. m. The dept. takes its name from two rivers of the same name, the Sèvre-Niortaise, which flows w. into the sea, and the Sèvre-Nantaise, affluent of the Loire. It is traversed from s.e. to n.w. by a chain of hills, called in the s.e. the Monts du Poitou, and in the n. the Plateau de Gatine. This ridge forms the water-shed between the Loire on the n. and the Charente on the s. The climate is generally healthful, and the soil, two-thirds of which is arable, is very fertile. There are numerous iron mines, and good quarries of freestone and marble. The arrondissements are Niort, Bressuire, Melle, and Parthenay. Niort is the capital.—Pop. of dept. (1876) 336,655; (1886) 353,766; (1891) 354,282; (1901) 342,474.

SEVRES PORCELAIN, *sāvr:* highly valued glazed earthenware or china, manufactured at *Sèvres*, in France.

SEW, v. *sō* [Goth. *siujan;* Dan. *sye;* Sw. *sy;* L. *suĕrĕ;* AS. *siwian*, to sew]: to join or fasten together by means of a needle and thread. SEW'ING, imp.: N. the art or occupation of using the needle; needlework. SEWED, pp. *sōd.* SEW'ER, n. *-ĕr*, one who sews. To SEW UP, to inclose in anything sewed; to inclose by sewing. SEWING-MACHINE, machine for sewing or stitching cloth (see below). SEWING NEEDLE, a needle used in sewing. SEWING SILK OR THREAD, silk or thread used for sewing.

SEWAGE, n. *sō'ăj* [Norm. F. *essuier* or *seuwière*, a conduit, the drain of a pond: OF. *esuer*, to dry—from mid. L. *exsucārĕ*, to deprive of moisture—from *ex*, out of; *sūcus*, juice; *sūgo*, I suck: Gael. *sùg*, to imbibe; *sùgh*, juice, moisture—and as a verb, to drink up, to drain: It. *succo*, juice]: the used water and liquid filthy matter of a town. SEW'ER, n. *-ĕr*, a channel or pipe to carry off the used or surface water and the liquid filthy matter of a town. SEW'ERAGE, n. *-ăj*, drainage by sewers; sewage; system of conduits or pipes laid underground for carrying off the liquid filth of a town: see below.

SEW'AGE: see SEWERAGE.

SEWAGE EARTH-CLOSET: contrivance in which the powerful deodorizing and other properties of dry earth are made available to deprive refuse of offense or harm. There are numerous forms of this kind of closet; one of the simplest consists of nothing more than a seat and a pan, the latter being lined round with earth by the help of a movable central mold or core. More convenient forms consist of a pail or a square-shaped pan on wheels under the seat, and an earth-box rising above it at the back. By one of several devices in use, a valve is opened at the bottom of the earth-box, which allows the proper quantity of earth to descend through a spout and cover the deposit. The earth-closet system is scarcely practicable in large towns, as it would be difficult to plan an economical arrangement by which the large quantities of earth required could be carried to and fro. But it has been used in villages, and in some large isolated buildings, such as jails and hospitals, and has found favor in India. In the United States it has been tried on a considerable scale: a competent authority reports that 'experience has taught that its power for usefulness is restricted by the difficulties involved in procuring, preparing, and removing the dry earth required in its use; and to some extent by those which attend, mechanically and chemically, the application of the earth to the dejecta. The inherent defects of the earth-closet reside in the seeming impossibility of obtaining just such perfection of mechanism as will completely do the required work automatically. It should never operate by weights, which act badly, and interfere with the space beneath.'—See SEWERAGE.

SEWALL, *sū'al*, JONATHAN: lawyer: 1728, Aug. 24–1796, Sep. 26; b. Boston, Mass. He was educated at Harvard, and began the practice of law in Charlestown 1758. He adhered to the cause of the crown at the beginning of the quarrel between the colonies and the mother country; became attorney-gen., advocate-gen., and was appointed to other places of emolument. He was an eloquent pleader and an acute expositor of the law. He won the release of a slave from bondage on the ground of the Eng. common law 1769, two years before that decision was reached by the courts in England. He made a spirited defense of the doctrines of coercion in the newspapers of the time. His house was wrecked by a mob 1774, and S. took refuge in England. He afterward settled in St. John, New Brunswick.

SEW'ALL, JOSEPH, D.D.: Congregational minister: 1688–1769; b. Boston, Mass.; son of SAMUEL S. He was educated at Harvard, graduating 1707; was ordained to the ministry 1713, and became colleague pastor of the Old South Church, Boston; this pastorate he held with great acceptance till his death. S. was offered, but declined, the presidency of Harvard Coll. 1724.

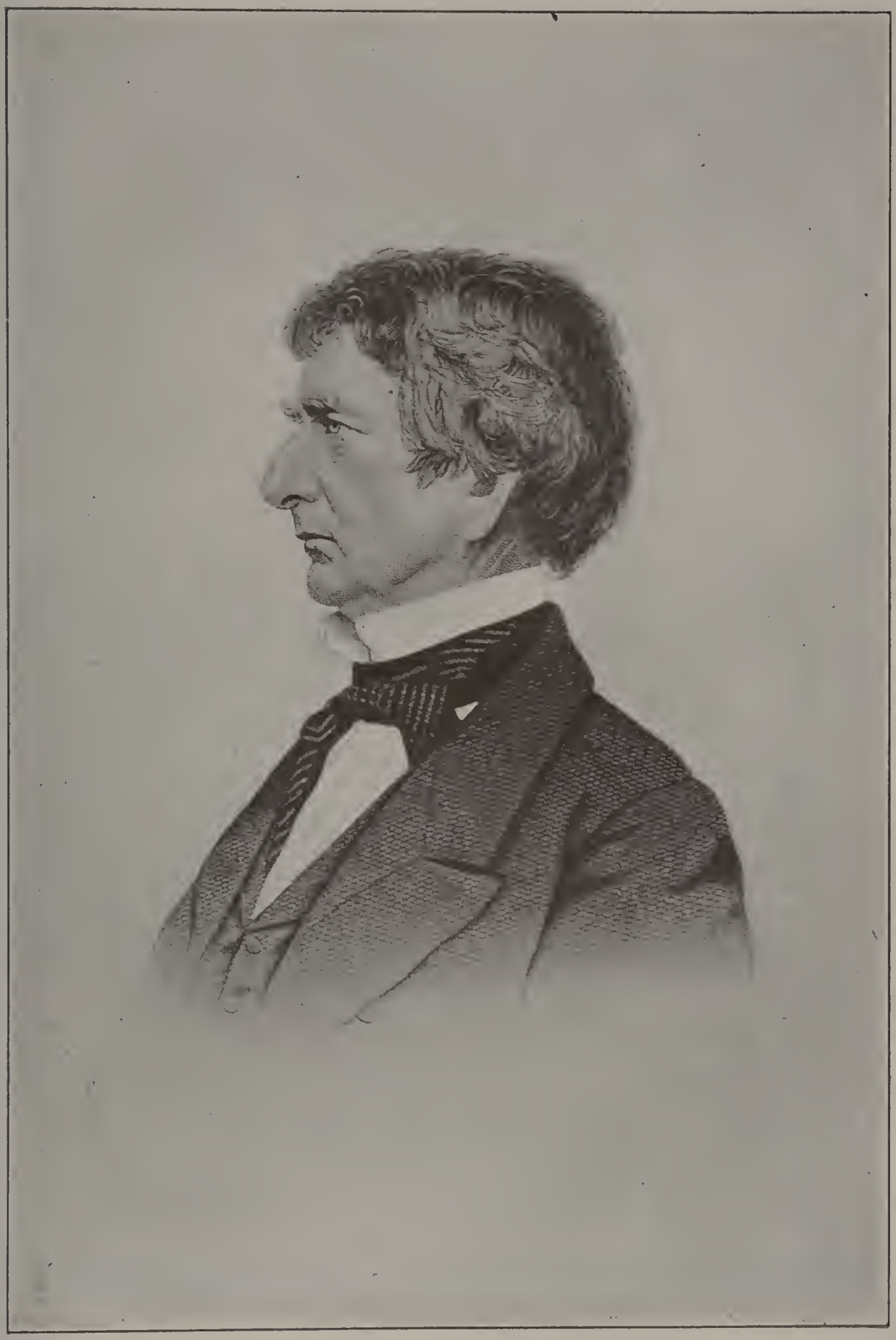
SEW'ALL, SAMUEL: jurist: 1652, Mar. 28—1730, Jan. 1; b. Bishopstoke, England. In his childhood he came with his parents to New England, and settled in Newbury, Mass. He graduated at Harvard 1671. He then studied theology, but after preaching once left the ministry. First he had charge of the printing-press in Boston for three years. He spent a year in England 1688. He was appointed member of the council and probate judge 1692. He was prominent among the judges who took part in the trials of the Salem witches. At the time, he was firmly convinced of the reality of witchcraft, and of the guilt of the alleged witches; but he soon became convinced of his error (which long afterward remained prevalent throughout Europe), and made public confession of his error, standing up before the congregation of the Old South Church, Boston, 1697, Jan., while his written confession was read by the minister. Thereafter for 31 years he annually gave one day to fasting and meditation upon his offense. He became chief-justice of Mass. 1718. He defended the rights of slaves in a tract *The Selling of Joseph* (1700); other writings by S. are: *The Accomplishment of Prophecies* (1713); *Memorial Relating to the Kennebec Indians* (1721); *Description of the New Heaven* (1727). His valuable MS. diaries and letter-book have been published in the *Collections* of the Mass. Hist. Society.

SEWARD, *sū'ërd*, WILLIAM HENRY, LL.D.: statesman: 1801, May 16—1872, Oct. 10; b. Florida, Orange co., N. Y. He was educated in the academy at Goshen in the same county, and at Union Coll., from which he went south to teach, before completing his course, but returned and graduated 1820. His law studies were pursued with John Anthon, of New York, and at Goshen. Admitted to practice in 1822, he settled the next year in Auburn, N. Y., as partner of Judge Elijah Miller, to whom he soon became son-in-law. He was active in favor of John Quincy Adams, in the Adams-Jackson-Crawford presidential contest of 1824, and again in 1828; having been chairman, the preceding year, of a young men's state convention to promote the election of Adams. His party, however, failing to give full support to its nominee, was disintegrated. In 1830 he was elected anti-Masonic member of the state senate, though he had previously declined nomination to congress by the anti-Masons. In the senate he was prominent in advocacy of public improvements, both commercial and educational, and in introducing an act against imprisonment for debt. On his motion the documents for the *Colonial History of New York*, published in a series of volumes by the state, were collected in this country and Europe. He defended the United States Bank 1832, and on the removal of its deposits condemned the measure in an able and memorable speech. At the close of each session he was selected to draught a minority address to the people. In 1834 he was nominated for gov. by the whig party, which had arisen from the ruins of the national republican; but he failed of election. Two years subsequently he accepted an agency to mediate between the

Holland Land Company and its tenants, in w. N. Y., and, though it was a difficult matter to settle, regarded even as endangering the personal safety of an agent, he succeeded so well that his unpopular task did not interfere with election to the governorship 1838. His term of administration was distinguished by liberal measures in regard to prisoners and the insane, recommended by him; but he incurred odium in advocating the extending of privileges to Rom. Catholics and foreigners, in respect to immigration, public schools, and political status. A great service rendered by him was in helping on the geological and natural-history survey of the state, the foundation of all succeeding state surveys, as the names of geol. periods and epochs witness: for the splendid series of reports, he wrote an able introduction, reviewing the achievements of the state in all departments. His second term as gov., 1840–42, is associated with the enlargement and extension of canals and the encouragement of railroads.

In the intervals of public life he was busy with law practice; and some of his most celebrated arguments in court were on the side of humanity, for its own sake, such as that for Van Zandt, on the charge of helping fugitives from slavery, and in defense of the negro Freeman, who murdered a whole family in Auburn. The people were excited even to the point of lynching the culprit, and it required no small courage to stand up alone for the prisoner. The defense was perhaps unfortunately that of 'moral insanity,' for the murderer was of low-grade intellect, and, on his death in prison some time afterward, his brain was found to be abnormal, probably from a cruel assault long before.

Although Mr. S. had at first been opposed by abolitionists, he was recognized as in harmony with them while gov., when he favored negro suffrage, and still more after his anti-slavery speech at Cleveland, not long before his election to the U. S. senate 1849. He had become an anti-slavery leader. It was in 1850 that he held up the 'higher law' that, from that moment, grew to be a common phrase, and later in the same year he made a speech on the compromise measures, as notable as his arguments on the repeal of the Missouri Compromise 1854. He opposed the southern policy of Fillmore 1850–53, and the platform on which Scott was nominated, but not Scott himself. He was re-elected senator 1855; was a supporter of Fremont 1856; made his 'irrepressible conflict' speech at Rochester 1858; travelled in the Orient 1859; received 173 votes out of 275 on the first presidential nominating ballot at Chicago 1860; and was sec. of state 8 years, under Lincoln and Johnson, opposing the impeachment of the latter and sustaining his policy. Severely wounded by one of the conspirators at the time of Lincoln's assassination, he slowly recovered. His service was very great in dealing with foreign powers during the civil war, in treaty-making, and in acquiring Alaska. After retiring from public duty he made extensive journeys in N. America and abroad. His many speeches and scholarly orations, and his history of



WILLIAM H. SEWARD.

his life and times (completed by his son), are included in his Works, 5 vols. (1853-84). He published *Life and Public Services of John Quincy Adams* (1849). He died at his home in Auburn.—His son, FREDERICK WILLIAM SEWARD, LL.D., b. Auburn, N. Y., 1830, July 8, was graduated from Union College in 1849, admitted to the bar in 1851, and for 10 years was one of the editors and owners of the Albany *Evening Journal* In 1861 he was sent to apprize Lincoln of the plot to assassinate him in Baltimore, served as assistant secretary of state in 1861-9 and in 1877-81, and narrowly escaped death in defending his father from the assault of 1865, Apr. 14. He went with Admiral Porter on the special mission to negotiate the treaties with the West Indies in 1867, assisted in the purchase of Alaska, and in the negotiations for Pago-Pago Harbor, Samoa. He was a member of the New York legislature in 1875, state commissioner at the Yorktown Centennial Celebration in 1881, and in 1900 became president of the Sagaponack Realty Company. He has published: *Life and Letters of William H. Seward* (1891); *A West Indian Cruise* (1894). His nephew, George Frederick Seward, b. Florida, N. Y., 1840, Nov. 8, was educated at Union College, and in 1861 was appointed United States consul to Shanghai, China, where he remained until 1876, serving as consul-general from 1863. In 1876-80 he was minister to China, but was recalled in the last named year in consequence of refusing to undertake the negotiation of a treaty to restrict Chinese immigration. During his residence in China he was active in suppressing riots and in reducing piracy. He has been vice-president of the North China branch of the Royal Asiatic Society since 1887, and since 1893 has been president of the New York Fidelity and Casualty Company. He has published: *Chinese Immigration in Its Social and Economic Aspects* (1881); *Digest of System of Taxation of New York* (1902); etc.

SEWELL, WILLIAM JOYCE: American statesman: b. Castlebar, Ireland, 1835, Dec. 6; d. Camden, N. J., 1901, Dec. 27. He came to the United States in 1846, served as a sailor for a time, and later engaged in business. He served in many battles of the Civil War, and at its close was brevetted brigadier-general and major-general. He was interested in railroad affairs after the war; was elected to the New Jersey senate in 1872, and was president of that body in 1876, 1879, and 1880. He was United States senator from New Jersey in 1881-7 and 1895-1901. In 1899 he became major-general of the New Jersey National Guard.

SEWELLEL, *sē-wĕl'lĕl* (*Haplodon rufus*, formerly *Aplodontia leporina*): rodent of the family *Diplodontidæ*, the molars being prismatic, without roots, and with simple crowns; the salivary glands are of great size; the carpals and metacarpals are 9. The sewellel is most near-

ly related to the beaver, but has a short tail, and is of the size of a musk-rat, which it resembles in form. The color is dark-brown, gray beneath. It burrows in the ground, is nocturnal in its habits—hence is seldom seen. Its food is roots and other vegetable substances. Peculiar to N. America, it is found in Oregon, Washington, and California, where, it is claimed, another species, *Californicus,* occurs. Other names of the sewellel are Mountain Beaver, Boomer, and Showt'l, the last in the Nisqually language. Sewellel is a corruption of She-wal-lal, which is an Indian word for dress made of the skins of the animal.

SEWER, n. *sū'ėr* [AS. *seaw,* juice—the same as OE. *sew,* pottage, boiled meat: comp. Low Ger. *sode and sōe,* so much as is boiled at once: W. *saig,* a dish of meat]: in *OE.,* an officer who placed and tasted the meat of a king or nobleman on the table; a head-servant who presided over the meats.

SEWER. See under SEWAGE.

SEW'ERAGE: process and system of receiving and removing from dwellings and other constructions refuse materials suspended in water; also the materials so removed, but these are more properly denominated *sewage.*

The methods of sewage disposal which are now practised in this country may be spoken of as crude disposal, disposal by chemical precipitation, by irrigation, and by filtration.

Crude Disposal.—Crude disposal contemplates discharging the sewage in its crude or unclarified state into some near water-course or body of water. This is usually by far the cheapest method of disposing of the sewage where the flow of the stream is large enough sufficiently to dilute the sewage at all seasons of the year; or should the town or city be located on the coast the sewage may be conducted in pipes into deep water and thereby sufficiently diluted to render it harmless.

Chemical precipitation consists in collecting the sewage in tanks, having just previously mixed with it certain chemicals, usually calcium oxide or "lime," the result of which is to precipitate all matter in suspension and a portion of the material in solution. A semi-fluid mass collects at the bottom of the tanks, called sludge, which may be drawn off or pumped into beds to drain and dry out, after which it is disposed of as the authorities see fit.

Irrigation, or Sewage Farming.—In irrigation the sewage is used to irrigate the crops, and the process is frequently called sewage farming.

It is very efficient when the land is of sufficiently porous, sandy or gravelly material, such being much better than that which is fine and more compact.

The sewage is discharged upon the ground, the coarser material being left on the surface, while the finer portions pass into the earth to a greater or less depth, depending upon the coarseness of the soil.

The water freed from the matter in suspension descends still further into the grouud, coming in contact with the air in the earth. The impurities which it contains are thereby oxidized, that is, purified by the action of bacteria dependent for life upon the oxygen contained in the air. The purified liquid may descend still lower, or it may be carried off in underground drains laid for that purpose. The insoluble matter is also oxidized by slow combustion, and is thereby reduced to a fine powder and mingles with the elements of the earth. In irrigation only such sewage is applied as will be beneficial to vegetation, and the prime object more often is the profit that may be derived from the crops raised. Irrigation therefore requires a large area, and the difficulty experienced by cities in successfully operating sewage farms restricts the use of this method in the United States almost entirely to the arid regions, where the soils require irrigation anyhow and where water for irrigation is scarce and valuable. This method is used to a considerable extent in Europe, notably in Paris, in Berlin and in Birmingham and several other English cities. From 5,000 to 25,000 gallons per acre per day may be purified by irrigation, the amount depending upon the porosity of the soil. A very high degree of purification can be attained by irrigation.

Filtration.—With the exception of irrigation under very favorable conditions, intermittent sand filtration furnishes the most efficient means of purifying sewage which is in common use. In this method the sewage is discharged intermittently upon the surface of sand filters from three to five feet deep. The area of filter needed will usually be one acre to every 100,000 to 150,000 gallons of sewage per day. Any clean, good, coarse sand will answer for the filter. The bottom of the bed is generally covered with a layer of graded pebbles or broken stone to make the drainage more nearly perfect. The filter is usually underdrained by lines of drain tile, placed about twenty feet apart. The theory of action of sand filters is, that upon the surface of the sand grains, bacteria of purification become established in innumerable quantities and work upon the organic matter in the sewage slowly trickling past them. In sand filters the bacteria are of the general class known as aerobic bacteria, or those which require oxygen to live. Hence the application of the sewage must be intermittent to allow each dose to penetrate down into the sand out of sight and draw air into the pores after it, before the next dose is applied. Sewage disposal plants having sand filters remove from 90 to 98 per cent of the organic matter from the sewage and from 98 to 99.9 per cent of the bacteria. In case the highest efficiency of purification is not essential, sprinkling filters are used to very good advantage, especially when a very high rate of filtration is required. The sprinkling filters are made of coarse

material, say one-eighth inch to one inch in size. Sewage flowing upon such coarse material would pass through the large pores too quickly to receive much purification. Hence the sewage must be sprinkled upon the top surface in drops to insure its simply trickling over the surface of the pieces of filter material. There are many devices for distributing the sewage in this way, including principally perforated arms and spray-nozzles. In the case of sprinkling filters, owing to the coarseness of the filtering material and the fact that the sewage is applied in drops and runs over the filtering material in films without filling the pores, sufficient air remains constantly in the pores of the filters to keep alive the aerobic bacteria of purification. Hence the application of sewage need not be intermittent, as in the case of sand filters. Sprinkling filters will purify from 1,000,000 to 2,000,000 gallons per acre per day, but they are not so efficient as sand filters. Fine black particles of partly purified organic matter often cloud the effluent to such an extent that settling tanks must be provided for clarification.

Comparison of Methods.—These form the principal methods of finally disposing of the sewage. The first, viz., that of crude disposal, cannot now be classed as a scientific disposition of the sewage for inland towns and cities. The country as a rule has been so denuded of timber that the rivers become very low during the periods of little rain, thus rendering this method of disposal at such times very dangerous, the flow of the stream not being adequate to dilute the sewage sufficiently. In many states legislation prevents the adoption of this method. Chemical precipitation, on account of the great cost of chemicals and labor required and the difficulty of satisfactorily disposing of the large amount of sludge precipitated, is now being considered a back number, although it was quite popular twenty years ago. Only 45 to 50 per cent of the organic matter can be removed by this method, which in itself condemns its use in most cases. The method of filtration is by far the best and is now being adopted all over the country. As a preliminary treatment of the sewage in connection with the methods described, settling tanks and septic tanks are often used.

Settling Tanks.—Settling tanks are used in order to dismiss part of the solid matter from the sewage, which might tend to compact the filters. Very little bacterial purification is carried on in the settling tanks.

Septic Tanks.—In the septic tanks the sewage is retained for a sufficient length of time for the solid matter to settle and for a certain species of bacteria called anaerobic (for the reason that they do not require the oxygen of the air to live) to germinate. In the decay of organic matter anywhere these germs are the active agents, and the septic tanks present very favorable conditions for the large development of the anaerobic bac-

teria. The sewage is introduced into these tanks and allowed to stand sufficiently long for the bacterial action. Usually the septic tanks are cleaned out once each year.

Two sewerage systems, the combined and the separate, have been successfully operated in this country and Europe.

The Combined System.—The combined system is one with which all towns are more or less familiar. It consists of a single set of sewers calculated to receive and carry away a certain portion of the storm water flowing on the surface and all the house drainage and industrial wastes produced along lines of streets where sewers are laid. Mechanically considered, it performs all these offices in a satisfactory manner and seems to comply with the requirements of purely engineering considerations. It prevents sidewalks and streets from being overflowed during ordinary storms and generally disposes of the surplus water, clean or foul, with a considerable degree of completeness. But let us see if there are not some defects in the method of disposal, even though some of the larger cities in this country have adopted the combined plan and consider it the most economical and practical one. There are many cases where the combined plan would be preferable, especially where the point of outlet is far removed from the center of the city and where the sewage does not have to be treated, as when it is discharged into the ocean. In order to provide for the removal of storm water, the sewers are made larger than are required for house drainage only; so that, during an interval between storms, the stream which would be ample to keep the sewer properly flushed, were the diameter small, is spread out over a larger surface and loses its power to keep it clean. The sewer being large, the air space is large, and ordinary methods of ventilation fail to change its contents with sufficient frequency to prevent the formation of foul gases. The drainage from the streets carries into the sewer foul rubbish of every sort, which remains deposited there to a greater or less extent. These deposits form a nucleus for further accumulation of putrefaction from the solid matter of house drainage, leading to greater foulness of an infrequently changed atmosphere, and thereby requiring the house connections to be carefully trapped, lest they deliver foul and infected air into the interior of dwellings. As combined sewers are made so foul in this way, it is also of great importance that their atmosphere be trapped away from the streets; and also that the amount of foul deposit may be reduced it is necessary to keep street rubbish out of them, and thus their inlets from the gutters are shut off by trapped catch-basins. These become the receptacles of sand, chips, mud and droppings from the streets, forming together a polluted, rotten mass, a source of local infection, the dangers of which are manifest to all. The whole tendency of modern

investigation is to show that the zymotic diseases are produced by bacteria, where germs are developed under favorable conditions. It is well known that the most favorable conditions for the growth of these low organisms are heat, moisture, darkness and the presence of ammonia. The damp walls of sewers present, therefore, all the requirements for the most abundant growth of these bacteria, whose germs may float off on the sewer air and be carried into dwellings by mechanical action, as dust is borne into our windows. Large sewers necessarily become the hotbeds for the propagation of these deadly organisms, the moist, porous walls forming a good soil for the pestilent growth, the ammonia from the sewage supplying the nutriment essential for their development, and the moist, warm air completing the process. The storm water falling per hour in violent rains over an area of closely built-up city land is nearly fifty times the amount of waste water and sewage produced per hour in the same area. The sewage, therefore, is a mere trickling thread in the bottom of a sewer large enough to carry off storm water. Let us suppose the sewer in question be one built of brick. In time of rain the sewer will be nearly or quite full of diluted sewage which is absorbed by the bricks and leaves a coating on them, as the flow decreases. The velocity of the stream being great, enough power is gained to carry along with it particles of solid matter which, as the stream subsides, are deposited along the water line of the sewer. These deposits form miniature dams at first, but are greatly enlarged by the constant additions of solid matter from house drains, which during the dry weather have not sufficient depth of flow to carry the matter on. Foul gases are then emitted, which in themselves are a source of great discomfort and danger. The occasional flushing of these large sewers, while it may clean out silt and accumulated filth and thus decrease the amount of heat and ammonia from decomposition, can never prevent the growth of bacteria on the sewer walls, nor will ventilation prove efficient. Every device of engineering has been exhausted to keep large sewers clean and well ventilated, but the air from them is still deadly. Experience, therefore, has taught and is teaching that there are some radical defects in the system of large or combined sewers. Perfect plumbing may prevent sewer gas from entering dwellings, but perfect plumbing is a rare exception, especially in rented houses. In view of this fact, are we not forced to conclude that the combined system is defective as far as sanitary requirements are concerned? Each and every town has, as a rule, certain requirements to be met, when a system of sewerage is to be devised, which should regulate the choice of the method to pursue. Naturally, great attention should be paid to economy, and, other things being equal, economy should control. Where the special requirement is to dispose of a surplus of surface

water during storms, this object should be in precedence to all else, yet the sanitary requirements must not be forgotten. All sanitarians are agreed that the chief aim, as far as removal of foul waste is concerned, whatever may be the system adopted, should be immediate and complete; and this principle of immediate and complete removal should apply to all laterals as well as main sewers.

The Separate System.—Let us now turn our attention to the separate system and see wherein it differs from the combined. In this method the chief aim is to separate the house drainage from the surface drainage, and storm water, where it is necessary to be carried off in conduit, is disposed of through special storm water sewers. By this separation, much smaller sewers will suffice for the house drainage, and on this account the flow through them will be more constant and there will be less chance for deposits, and less wall surface will be exposed on which bacteria can germinate, and there will be less space for storing up germ-laden air. The gases and heat decomposition which so powerfully stimulate the growth of organic matter are prevented by thorough daily flushing, which is practicable only in small sewers. The smooth glazed surface of the pipe-sewer is unfavorable soil for this vegetable growth, compared with the porous bricks, moistened with sewage. So much smaller sewers will suffice to carry off the sewage only that their cost need be but a fraction of what would be required to build sewers admitting rain; and by adopting this plan many towns can avail themselves of the benefits of sewerage which would otherwise be prevented by this extra expense.

The Memphis System.—It was at Memphis, Tenn., that the separate system of sewerage was first given a practical test. In the year 1878 the city was visited by a dire contagion, the deaths resulting from yellow fever alone amounting to 5,150. This city naturally became an important subject for sanitary discussion. Many engineers were called upon to give their views as to the best way to cleanse the city and make it habitable. The plan submitted by the late George E. Waring was finally adopted, and in January, 1880, the work was begun. All those interested in sanitary improvement now turned their attention to Memphis, for Waring's plan was the separate system pure and simple, and this was a vital test of its efficiency. The house drains were four-inch pipes, and the sewers ran from 6 to 12 inches in diameter, except in special cases where larger pipes were used, but these were rare. Flush tanks were put in and rendered very good service. The effect of the flush is not only to wash out the sewer, but also to force air through the house drains, which it has been frequently observed to do with considerable power. The report of the City Engineer of Memphis for the year 1886 was very favorable

and spoke very highly of the result of the finished work. In places of moderate size the accumulations of storm water can be led by short and inexpensive drains directly to a suitable outflow without being taken in artificial channels over a longer course, and this applies to a greater extent than is generally supposed to large cities. Since the separate system of sewerage underwent its first test at Memphis in 1880—and from that time it has been known as the "Waring system"—it has been adopted in a great number of towns and cities, and the results are most favorable. Flushing tanks, by the regularity and frequency of their discharge and by the large body of water precipitated into the dead end of the sewer, sweep out with one rush any chance accumulation of filth. The flush caused by the introduction of rain water through sewage is constant and wholly dependent upon its intensity. The flush from an automatic flush tank is sudden and violent. Considering 1 inch per hour as the maximum rainfall, from the roof of a house 25x50 feet in size, or 1,250 square feet in area, there will flow 780 gallons in one hour. The flush tank discharging 160 gallons in fifty-five seconds, which was the average capacity of those at Memphis, would have great advantage over the former, for while the roof discharges 780 gallons in an hour, in fifty-five seconds it would discharge only 12.37 gallons; so in violent storms the discharge from thirteen buildings of the above dimensions would be necessary to equal that of the ordinary flush tank. In case the sewage has to be purified, the separate system is more economical, because only the sanitary sewage need be treated.

General Conclusions.—The general conclusions of sanitary engineers at present regarding the relative merits of the separate and combined systems are as follows:

(a) Either system can be made satisfactory from a sanitary point of view.

(b) On a basis of cost the separate system is usually best for small cities and for all cases, even in large cities, where the sanitary sewage requires treatment, while the storm water can be safely discharged into nearby water-courses. The separate system is to be used in Baltimore on this last account.

(c) Often a combination of the two systems can be used to advantage, storm water being admitted to the sewers only in certain business districts.

It appears, generally speaking, unwise to dilute sewage with storm water and to befoul storm water with sewage in the attempt to remove both by the same underground channel. While a foul and ill-ventilated sewer is always a source of danger and much worse than none at all, a well planned, well built, well used, well ventilated and well flushed sewer approaches very near to sanitary perfection. To those who are interested in the treatment of sewage a visit to the city of Worcester, Mass., affords a very excellent opportunity to study the most up-to-date

methods now practised in this country. At Worcester they are using chemical precipitation, intermittent filtration, sprinkling filters and also the septic process as a preliminary treatment. At Worcester, it is stated, they can handle 150,000 gallons per acre per twenty-four hours by intermittent filtration, and by the sprinkling filter process a daily capacity of 1,000,000 gallons per acre can be realized.

Chemical precipitation appears to be a back number on account of the low degree of purification and the large quantity of sludge which must be disposed of.

SEWING MACHINES: on July 17, 1790, Thomas Saint, an Englishman, secured a patent on a machine to be used for 'quilting, stitching, and sewing, making shoes and other articles.' The patent was for some sort of a machine connected with boot-making, and the specifications and drawings of the patent comprised, among other things, a crude stitching device for forming a chain stitch. This patent was discovered a few years ago by a searcher among the ancient archives of the British Patent Office, where it had lain unnoticed for well-nigh a century, no attempt, so far as is known, having ever been made to introduce into practical use the mechanisms described in the patent. Between 1790 and 1841 several parties obtained patents for stitching devices, making the tambour and chain-stitches, none of which was commercially successful, one of the fatal defects in each being the fact that the cloth had to be fed by hand. When, in 1841, Newton and Archbold patented in England a needle with an eye near the point, and which is essentially the same needle now in use by all sewing-machine manufacturers, one of the greatest difficulties that had theretofore stood in the way of making the sewing machine a practical success was overcome. In 1818 a sewing machine which made a back-stitch was invented by the Rev. John Adams Dodge, of Monkton, Vt., but was neither patented nor manufactured for sale. The first sewing machine put into operation was patented in France, in 1830, by Barthlémy Thimonnier, and was used principally in the manufacture of clothing for the French army, but it was later destroyed by a mob. In 1848 he put another machine on the market and on Sept. 3, 1850, took out a patent in the United States. A machine having a needle with an eye near the point attached to the end of the vibrating arm was invented and manufactured in 1832-4, in New York, by a machinist named Walter Hunt. This machine was a lock-stitch and used two continuous threads. In 1842 a machine for sewing leather and various other heavy materials was invented by J. J. Greenough, but this did not become generally used. In 1843 a machine somewhat similar to the Greenough machine was invented by George H. Corliss. This had an automatic feed, and the needles, of which there were two, were run horizontally through the goods to be sewed. Numerous other inventions were

made between the years 1849 to 1851, the most important of these being the machine for the manufacture of clothing made by Lerow and Blodgett. This had a curved shuttle, adjustable feed, and automatic tension, and the baster-plate consisted of a circular hoop studded with pins. The next invention patented that covers a fundamental and important feature was that of John Bachelder, patented May 8, 1849. Bachelder's machine was the first to embody the horizontal table with a continuous feeding device that would sew any length of seam. His invention consisted of an endless leather belt set with small steel points projecting up through the horizontal table and penetrating the material to be sewed, carrying it along intermittently at a proper time to meet the action of the needle.

Elias Howe, Jr., began his experiments in 1843, and secured his first patents 1846, Sept. 10. Howe's principal improvements were the shuttle, producing the lock-stitch, and the feed motion. Later, Howe made other improvements, but the machine bearing his name was not patented until 1857. Howe's invention consisted of the combination of the eye-pointed needle with a shuttle for forming a stitch, and an intermittent feed for holding and carrying the material forward as each stitch is formed. The mechanical device for the feed was called the 'baster-plate,' and the length of the seam sewed at one operation was determined by the length of this plate. The material to be sewed was hung by pins to the 'baster-plate' in an upright position, and if the seam to be sewed was of greater length than the plate it was necessary to rehang it on the plate, which was moved back to position in the same manner as a log is carried back and forth in a saw-mill.

In 1847 Allen B. Wilson, then working as a journeyman cabinet-maker in Adrian, Mich., conceived the idea of a sewing machine, although he had never heard of one. He did not complete full drawings of his machine until the latter part of 1848. Early in 1849 he determined to build a model, and began, on Feb. 3, 1849, the construction of his first machine, which he completed in about 60 days. Having been compelled, by lack of means, to construct every part of the machine himself, the iron and steel as well as the wood, although he was not a practical machinist and lacked suitable tools for the metal work, the machine was consequently of imperfect construction, and could not illustrate in the best manner the principles of his invention. It worked, however, and with it were made dress waists and other articles that severely tested its capacity. This machine made the lock-stitch, the lower thread being carried by a double-ended shuttle. The machine contained the first automatic feed movement ever produced, and was the first that could sew curved seams or turn a sharp angle. Without such a device, the machine would have been a practical failure, as Howe's

really was, and as were all others until Mr. Wilson's inventions. His first device was what is known as the 'two-motion feed,' to distinguish it from his 'four-motion feed,' a still more effective device afterward invented by him. The 'two-motion feed' consisted of a horizontally reciprocating tooth surface (the pitch of the teeth being forward) engaging the material at all times, and while the needle was in the material moving back to take a new stroke. A patent on this machine was granted Mr. Wilson on Nov. 12, 1850. Wilson had, while in New York, constructed a model of a machine containing a rotary hook and reciprocating bobbin, and gave all his energies to perfecting the new machine, obtaining a patent for it Aug. 12, 1851.

It is a remarkable coincidence that on the same day a patent was granted to Isaac M. Singer for his first machine. The main features of the Singer machine were its straight needle, working at the extremity of a stationary overhanging arm, and its feed, consisting of a roughened wheel. A straight shaft in the overhanging arm imparted the motion to the needle, and the shuttle was driven in its race below the feed table by a mechanism deriving its motion from the shaft by means of gearing. The feed consisted of an iron wheel with a corrugated surface, the top of which was slightly elevated above the level surface of the table. By an intermittent motion the feed carried the cloth forward between stitches without injury to the fabric. This device permitted the cloth to be turned in any direction by the operator while sewing, which was impossible with the styles of feed which perforated the goods. The material was held in place by a presser foot alongside the needle. This presser foot embraced an important feature possessed by no other sewing machine up to that time—the yielding spring, which would permit of passage over seams, and adjust itself automatically to any thickness of cloth. It was claimed that this was an improvement over Mr. Wilson's first feed, in that there was no backward motion while in contact with the cloth. It had, however, the disadvantage of touching the cloth only on a small portion of its periphery—theoretically at only a point, and practically only a little more. It was claimed by Messrs. Wheeler & Wilson to be really an infringement of Wilson's patent, the principle of which was the holding of the cloth between a roughened or toothed surface on the under side and a smooth surface touching it with an intermittent motion, permitting the turning of the cloth in either direction while the machine was in motion; and this claim was sustained by the court.

On Dec. 19, 1854, a patent was issued for Mr. Wilson's celebrated 'four-motion feed,' so called from the peculiarity of the device by which the flat-toothed surface of the feed, being in contact with the cloth, is moved forward, carrying the cloth with it; then drops out of contact with the cloth, is moved backward and then rises up

against the cloth and is again ready for the first motion. This device solved the problem of a thoroughly practical and effective feed, and was soon generally adopted and has become the feed motion of the world. This feed motion, although it was not patented until this late date, had been long previously invented by Mr. Wilson, and was described in his application for a patent in 1851, but the claim was not pursued for the reason that he believed at the time that he had been anticipated by W. O. Grover, of the firm of Grover & Baker. It was ascertained afterward, however, that Mr. Wilson was really prior in the invention, and, without contest on the part of Mr. Grover, the patent was granted to Mr. Wilson. This machine was invented by Grover & Baker on Feb. 11, 1851, and had a double-loop stitch made by a combination of a circular reciprocating under needle and a curved upper needle with an eye near the point. This eliminated both shuttle and bobbin and rendered it possible for the upper and under threads to be taken from commercial spools. These machines, though once popular, are not now manufactured. In 1855 litigation arose involving the three principal sewing-machine companies then in existence, each claiming that the others were infringing upon certain of their patent rights, and numerous suits were instituted, more particularly by Howe, whose patents were so skillfully drawn that he claimed all others were infringements. In 1856 the three principal sewing-machine companies—Wheeler & Wilson, Singer and the Grover & Baker—formed a combination. It was contracted by the three companies and Mr. Howe that they would stop their litigation, and, with a fair payment to each other and to Mr. Howe for special rights, would carry on the business with only honorable competition. They finally agreed to license any responsible person who should propose to engage in the manufacture of a good machine on the payment of a royalty, which for several years was $3 on a machine.

The next machine to be put on the market was the Willcox & Gibbs. This machine, which had a rotating hook for using a single thread to make the twisted loop-stitch, was first patented in 1857, June, by James E. H. Gibbs, of Millpoint, Va. Later James Willcox, of Philadelphia, added some further improvements, and the machine then became known as the Willcox & Gibbs. Several years afterward an automatic tension was placed on this machine by Charles H. Willcox.

While the manufacture of machines for the home has been developing and progressing, those for manufacturing purposes have in no less a degree been brought to a state bordering on perfection. There are now machines for making—or which have special attachments for making—every conceivable article of clothing, upholstery, embroidery, leather goods, etc. We have the button-hole, the button-sewer, the French-knot, the faggoting, feather-

stitching, hemstitch, side and box-plaiters, corset machines; the cylinder for seam work on sleeves, trousers, bootlegs, leather buckets, etc.; machines for embroidery, smocking, carpet, awnings, etc.; the single and double-needle machines and those with four, six, and eight needles for glove work, special machines for overalls, sail-making, flag-making, and a host of others too numerous to mention. Many of the machines may be used for several different purposes by simply changing the style of feed motion, presser foot, needle, etc., while the other parts of the mechanism remain substantially the same. There have been several thousand patents granted on sewing machine appliances.

SEX, n. *sĕks* [F. *sexe,* sex—from L. *sexus,* a sex, male or female—perhaps from L. *seco,* I cut, or akin to Gr. *tekos,* offspring, progeny: Sp. *sexo*]: the distinction between male and female; applied to women by way of emphasis; in *bot.,* the structure of plants corresponding to sex in animals. SEX'LESS, a. *-lĕs,* without sex. SEX'UAL, a. *-ū-ăl* [mid. L. *sexuālĭs,* sexual]: pertaining to the sex or the sexes. SEX'UALLY, ad. *-lĭ.* SEX'UAL'ITY, n. *-ăl'ĭ-tĭ,* the state or quality of being distinguished by sex. SEXUALIZE, v. *sĕks'ū-ăl-īz,* to distinguish into sexes; to personify. SEX'UALIZING, imp. *-ī-zĭng.* SEX'UALIZED, pp. *-īzd.* SEX'UALIST, n. *-ĭst,* one who adopts the Linnæan system of botany. THE SEX, women in general. SEXUAL SYSTEM, in *bot.,* the system of the naturalist Linnæus, founded upon the character of the organs of reproduction in plants, or their apparent absence.

SEX, *sĕks* [L. *sex*]: a prefix signifying six.

SEXAGENARIAN, a. *sĕks'ă-jĕ-nā'rĭ-ăn* [L. *sexagenārĭus,* sixty years old—from *sexagēnī,* sixty each; *sexagin'ta,* sixty: F. *sexagénaire*]: being 60 years old: N. a person aged 60. SEXAGENARY, a. *sĕks-ăj'ĕ-nĕr-ĭ,* designating the number 60: N. something composed of sixty.

SEXAGESIMA, n. *sĕks'ă-jĕs'ĭ-mă* [L. *sexages'ĭmus,* sixtieth—from *sexagin'ta,* sixty: F. *sexagésime*]: second Sunday before Lent, being about 60 days before Easter.

SEXAGESIMALS: in Arithmetic, numbers written in the scale of 60, instead of the common base 10. They were employed by the ancient Babylonian and Egyptian astronomers and arose from the division of the year into 360 days, the subdivisions being probably suggested by the inscribed hexagon, whose side equal to the radius subtends 60 of the divisions when marked on the circle. The sexagesimals were adopted by the Greek astronomers, who made especial use of the sexagesimal fractions. The system continued in use in general computations down to the middle ages and survives in our division of the circle into degrees, minutes, and seconds and related division of time. The names 'minute' and 'second' come from the *partes minutæ primæ* and *partes minutæ secundæ* of the Latin translators of Ptolemy.

SEXENNIAL, a. *sĕks-en'ni-al* [L. *sexen'nis*, six years old—from *sex*, six; *annus*, a year]: happening once in six years, or lasting six years. SEXEN'NIALLY, ad. *-lĭ*.

SEXT, n. *sĕkst*, or SEXTE, n. *sĕks'tē* [F. *sexte*—from L. *sextus*, sixth; *sex*, six]: a division in the offices of the Rom. Cath. Church; devotions for the sixth hour of the day, or noon: see CANONICAL HOURS, under CANON.

SEXTAIN, n. *sĕks'tān* [L. *sex*, six]: a stanza of six lines.

SEXTANT, n. *sĕks'tănt* [F. *sextant*—from L. *sextans* or *sextan'tem*, a sixth part—from *sex*, six: Sp. *sextante*]: in *math.*, the sixth part of a circle: instrument like a quadrant, but having an arc of only 60 degrees, or the sixth part of a circle, used at sea and by astronomers.—A *Sextant* is an instrument for measuring the angular distance of objects by means of reflection. The principle of its construction depends on the theorem, that *if a ray of light suffer double reflection, the angle between the original ray and its direction after the second reflection is double of the angle made by the reflecting surfaces.* Thus let A and B (fig. 1) be two mirrors perpendicular to the same plane, and inclined to each other, and let SA be a ray of light, which falling upon A is reflected on B, and reflected in the direction BC, then ACB is the angle between the original and finally reflected rays, and ADB is the angle between the mirrors. Now, as the angle of reflection is equal to the angle of incidence, the angle SAF = BAD, and GBA = DBC; but EBC = BAC + BCA = (BAD + DAC) + BCA = (BAD + SAF) + BCA = 2 BAD + BCA; and EBC also = EBD + DBC = EBD + GBA = 2 EBD = 2 BAD + 2 BDA; therefore BCA = 2 BDA, which proves the truth of the theorem. The instrument of which this theorem is the principle is a brass sector of a circle in outline; the sector being the sixth part of a complete circle, for which reason the instrument is called a *sextant*. Fig. 2 shows the essentials of its construction; AMN is the sector whose curved side, MIN, is the sixth part of a circle; A is one mirror wholly silvered, placed perpendicular to the plane of the sector, and on, and in line with, the limb AI, which is movable round a joint at or near A; B is the other mirror, also perpendicular to the plane of the instrument, and silvered on the lower half only, the upper half being transparent; E is an eyelet-hole or small telescope. The graduation runs from N to M on a slip of silver, platinum, or gold let

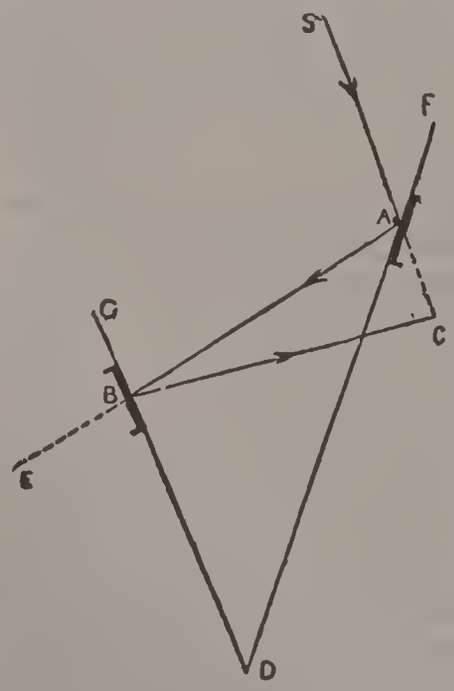


Fig. 1.

into the rim), and is so adjusted that when the movable limb is drawn toward N till the mirrors A and B are parallel, the index, which is carried at the foot of the movable limb, is opposite zero on the graduation. If we suppose that this zero-point is at N, it is evident that the angle between the mirrors is equal to the angle NAI; and again, if instead of graduating from 0° at N to 60° at M, which is the proper graduation for the sixth part of a circle, the graduation be made from 0° to 120°, that is, each half degree being marked as a degree, and similarly of its aliquot parts, then the angle NAI, read off by the index at I, will show at once the angle between the incident and finally reflected rays. The mode of using the sextant consists in placing the eye to the telescope or eyelet-hole, and observing one object directly through the unsilvered part of B, and then moving the index till the image of the other object reflected from A upon the silvered part of B, coincides with, or is opposite to the first object, then the angle, read off at I, gives the angle between the objects. For additional accuracy, a vernier is attached to the foot of the movable limb.

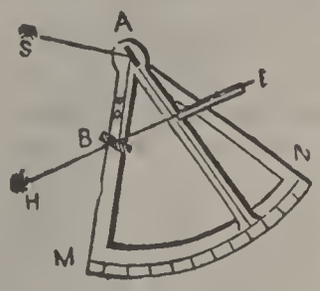


Fig. 2.

The sextant is capable of very general application, but its chief use is on board ship to observe the altitude of the sun, the lunar distances, etc., in determining the latitude and longitude. For this purpose, it is necessary to have stained glasses interposed between the mirrors A and B, to reduce the sun's brightness. These glasses (generally three in number) are hinged on the side AM, so that they may be interposed or not at pleasure. B is the glass through which the horizon is perceived, and has hence received the name *horizon-glass;* while the other mirror, from its being attached to the index-limb, is called the *index-glass.*

The sextant is liable to three chief errors of adjustment; 1° if the index-glass be not perpendicular to the plane of the instrument; 2° if the horizon-glass be not perpendicular to the plane of the instrument; and 3° if, when the mirrors are parallel (which is the case when a very distant body, such as the sun or moon, is observed directly through B, and found to coincide with its image in the lower part of B), the index does not point accurately to 0 . this last is called the *index error,* and is either allowed for, or is remedied by means of a screw, which moves the index in the limb AI, the latter being stationary. The first two errors also are frequently remedied by means of screws working against a spring, but in the best instruments the maker himself fixes the glasses in their proper position.—The *quadrant* differs from the sextant only in having its arc the fourth part of a circle, and being consequently graduated from 0° to 180°; the *octant* contains 45°, and is graduated from 0° to 90°; while the *repeating-circle,* which is a complete circle, is graduated from 0° to 720°. A common form of the sextant is the 'snuff-box' sextant, circular in shape,

and which, being conveniently carried in the pocket, is the form most used by land-surveyors.

The idea of a reflecting instrument, on the principle of the sextant, was given first by Hooke about 1666; but the first instrument deserving the name was invented by John Hadley (q.v.) early in the summer of 1730, and a second, and much improved form, was made by him soon afterward. Halley, at a meeting of the Royal Soc., claimed for Newton the priority of invention; and 1730, Oct., a Philadelphian, named Godfrey, also asserted his claim as the original inventor; but that learned body decided that Newton's claim was unsupported by even probable evidence, and that Hadley's and Godfrey's inventions were both original, but that the second form (almost the same as the common sextant now employed) of Hadley's instrument was far superior to his first form and to Godfrey's.

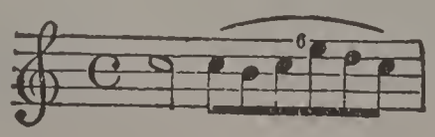
SEXTET, n. *sĕks'tĕt*, or SEXTETTO, n. *sĕks-tĕt'tō* [It. *sestetto*—from L. *sextus*, sixth]: in *music*, a composition for six voices or six instruments.

SEXTILE, n. *sĕks'tĭl* [L. *sextīlis*, sixth—from *sex*, six]: the aspect or position of two planets when 60 degrees or two signs apart.

SEXTILLION, n. *sĕks-tĭl'yŭn* [L. *sextus*, the sixth, and Eng. *million*]: in *Eng. notation*, a million raised to the sixth power, or a number expressed by a unit followed by 36 ciphers; in *Fr. notation*, represented by a unit followed by 21 ciphers.

SEXTO, n. *sĕks'tō* [L. abl. sing. of *sextus*, sixth]: volume formed by folding the sheets into six leaves each.

SEXTON, n. *sĕks'tŭn* [contr. from SACRISTAN (q.v.): OE. *sekesteyn;* F. *sacristain*]: *formerly*, the keeper of the sacristy, where the sacred vestments, etc., of a church are kept: now an inferior officer of a church or congregation, who prepares graves, attends to the burials, cleans the church, etc.; a gravedigger. SEX'TONSHIP, n. the office of a sexton.—A *Sexton*, in England, is a parochial officer whose duty is to take care of the things belonging to divine worship, and to attend to interments in the churchyard. He sometimes holds the office also of parish-clerk. Women have occasionally been appointed sextons. In Scotland, the beadle performs similar duties.

SEXTUPLE, a. *sĕks'tū-pl* [L. *sextus*, the sixth; *plico*, I fold]: sixfold. SEX'TUPLET, in music: when a note is divided into six parts instead of the usual division into four—e.g., a minim into six quavers, or a crotchet into six semiquavers—the group is called a sextuplet, and the figure 6 is generally placed above it. The proper sextuplet is composed of three groups, of two notes each, being, in fact, a Triplet (q.v.), with each of its notes subdivided into two:  But a group composed of two successive triplets is sometimes, though not

very correctly, also called a sextuplet, and written as such, though it is more correct to divide it into its component two triplets, thus:

SEX'TUS (surnamed EMPIRICUS, from his belonging to the empiric school of medicine) was a skeptic who flourished in the first half of the 3d c. He was a Greek by birth, and lived at Alexandria and Rome. Skepticism appears in his writings in the most perfect state which it reached in ancient times. We have two works by him, written in the Greek language, and they are the source of our knowledge of the Greek skeptical philosophy. One of them entitled *Outlines of Pyrrhonism,* in three books, explains the method of Pyrrho; the other, entitled *Against the Mathematicians,* is an attempt to apply that method to all the prevailing philosophical systems and other branches of knowledge.

SEXUAL SELECTION: a term invented by Darwin to denote a special phase of natural selection, depending on a competition between rival males, in which a premium is set on those qualities which favor their possessors in securing mates. This competition takes two forms: On the one hand, rival mates, for instance stags or gamecocks, fight with one another, and the conquerors have naturally the preference in mating; on the other hand, rival males sometimes seem to vie with one another in displaying their attractive qualities before their desired mates, who, according to Darwin, choose those that please them best. Darwin gives the following summary of his theory:

> It has been shown that the largest number of vigorous offspring will be reared from the pairing of the strongest and best-formed males, victorious in contests over other males, with the most vigorous and best-nourished females, which are the first to breed in the spring. If such females select the more attractive and, at the same time, vigorous males, they will rear a larger number of offspring than the retarded females, which must pair with the less vigorous and less attractive males. So it will be if the more vigorous males select the more attractive and, at the same time, healthy and vigorous females; and this will especially hold good if the male defends the female, and aids in providing food for the young. The advantage thus gained by the more vigorous pairs in rearing a larger number of offspring has apparently sufficed to render sexual selection efficient.

In regard to the second aspect of sexual selection, in which the females are believed to exercise some choice, giving the preference to those suitors which have brighter colors, more graceful forms, sweeter voices, or greater charms of some kind, there is no little difference of opinion. Darwin indeed believed strongly in the female's choice, and referred to this process of selection many of the qualities which distinguish male animals. The females 'have by a long selection of the more attractive males added to their beauty or other attractive qualities.' On

the other hand, Alfred Russel Wallace maintains a very different position. 'There is,' he says, 'a total absence of any evidence that the females admire or even notice the display of the males. Among butterflies there is literally not one particle of evidence that the female is influenced by color or even that she has any power of choice, while there is much direct evidence to the contrary.' Against this, G. W. and E. G. Peckham, in their careful essay on sexual selection in spiders, state that they have in the *Attidæ* 'conclusive evidence that the females pay close attention to the love dances of the males, and also that they have not only the power, but the will, to exercise a choice among the suitors for their favor.' Some observers of birds are also confident that the females choose the more musical or otherwise attractive males. But again Wallace maintains that the fact that every male bird finds a mate 'would almost or quite neutralize any effect of sexual selection of color or ornament; since the less highly colored birds would be at no disadvantage as regards leaving healthy offspring.'

The theory of sexual selection is of considerable importance in a general theory of evolution. This may be illustrated in reference to the bright plumage of many birds. If we postulate successive crops of variations (which cannot at present be completely rationalized), if we acknowledge that there is really 'preferential mating' among birds (which is not readily proved or disproved), if we believe that the females are sensitive to the slight excellences which distinguish one suitor from another and that their choice of mates is determined by these excellences (which Wallace emphatically denies), then we may say that the greater brightness of male birds may have been evolved by sexual selection. This was Darwin's opinion. The brighter males succeeded better than their rivals in the art of courtship; the variations which gave them success were transmitted to the offspring; gradually the qualities were established and enhanced as secondary sexual characters of the species. But Wallace interpreted the facts quite otherwise. The relatively plain plumage of the female birds was due to natural selection, eliminating those whose conspicuousness during incubation was fatal, fostering those whose coloring was protective. Just as Daines Barrington, a naturalist, still remembered as the correspondent of Gilbert White, suggested (1773) that singing birds were small and hen birds mute for safety's sake, so Wallace maintained that female birds had forfeited brightness as a ransom for life.

The doubts and difficulties arouse skepticism as to the thoroughness of the explanations of secondary sexual characters suggested either by Darwin or by Wallace. It is not surprising, therefore, to find Mivart's explanation of the beauty of males as the direct expression of an internal force, or Mantegazza's hints as to physiological explanation of the sexual divergence, or Brook's

reference to 'something within the animal which determines that the male should lead and the female follow in the evolution of new breeds.' Geddes advanced further, endeavoring to interpret the secondary sexual characters as outcrops of the relative preponderance of anabolism and katabolism characteristic of females and males respectively. Gay coloring—sometimes at least due to pigmented waste products—is regarded as a characteristic expression of the predominantly katabolic or male sex, and quiet plainness is equally natural to the more anabolic females. But this theory, which seeks to rationalize the variations which Darwin simply postulated, is by no means inconsistent with a recognition of sexual selection as an accelerant directive process in the evolution of male brightness, or of natural selection as a retardative directive process eliminating disadvantageously conspicuous females.

Wallace in his later works advanced toward a rational interpretation of the variations which he was previously content to postulate as facts. For he says that 'ornament is the natural outcome and direct product of superabundant health and vigor,' and is 'due to the general laws of growth and development.' It seems to some that this mode of interpreting characters is of far-reaching importance, and that it affects not only the theory of sexual selection but that of natural selection as well.

To sum up, the problems involved in sexual selection are (1) what physiological conditions explain the secondary sexual characters which so often distinguish males and females; (2) to what extent and in what degree of refinement does preferential mating occur; and (3) to what extent has sexual selection guided the differentiation of the sexes alike in distinctive qualities and in æsthetic sensitiveness? Before these problems can be adequately solved many more facts must be accumulated.

Consult: Darwin, *Origin of Species, Descent of Man;* Wallace, *Natural Selection, Darwinism;* L. Morgan, *Habit and Instinct,* and other books.

SEYCHELLES CO'COA-NUT, *sā-chĕl',* or DOUBLE COCOA-NUT (*Lodoicea Seychellarum*): palm, whose fruit has some resemblance to a cocoa-nut, though it belongs to a different tribe of palms, being allied to the Palmyra Palm. It is found only in the Seychelles Islands; and the fruit, wafted by the winds to the shores of the Maldive Islands, or found floating in the Indian Ocean, was long the subject of ridiculous fables, and is still an object of interest and curiosity, and as such one of the minor articles of commerce. The tree grows to the height of 50 or 60 feet, with a tuft of immense leaves. The wood and the leaves are used for a variety of purposes, like those of other palms. The 'cabbage' or terminal bud is eaten. The fruit is often 12 or 18 inches long, in shape like a melon, its outer husk green, the interior near the base divided into two parts, at first filled with a

white sweet jelly, which changes into a white horny kernel. The shells are used for making vessels of various kinds, often beautifully carved and ornamented.

SEYCHELLES ISLANDS, *sā-shĕl′*: archipelago of more than 30 isles, nearly in the center of the Indian Ocean, between 3° 40′—5° 35′ s. lat., and 55° 15′—56° 0′ e. long.; resting on an extensive bank of sand and coral, and forming the most important of the dependencies to the colony of Mauritius. The principal are Mahé, Praslin, Silhouette, La Digne, Curieuse, St. Anne, Aux Cerfs, Frégate, Marianne, Longue, and Du Sud Est. Mahé, most considerable and populous of the group, and the seat of government, is 18 m. long and 3 to 5 broad. The islands are mountainous, often rising abruptly from the sea, and are clothed with most luxuriant verdure; one of the peaks, Mont Blanc, in Mahé, having a height of 3,000 feet. The principal port is Victoria, on the n.e. side of the island of Mahé; its houses formerly were chiefly of wood; but now coral is universally employed. Coral is growing rapidly all round this group of islands. At Port Victoria, where the soundings were recently given at 7 fathoms, the coral has piled itself up to within 2¼ fathoms of the surface. In the neighborhood of Port Victoria is a beautiful church built of coral.

The Seychelles were known to the early Portuguese navigators, who named them Isles de Mascarenhas; subsequently the French renamed them Iles La Bourdonnais, and finally changed their appellation in honor of the Count Herault de Seychelles. They were first settled by the French 1756, who began cultivation of spices, under circumstances so favorable as to induce a belief in a lucrative competition with the more easterly colonies of the Dutch. The immunity of the Seychelles from the hurricanes which periodically visit the neighboring seas rendered them peculiarly suited for this purpose, which, however, received a severe blow by the destruction of the spice-plants by the French occupants, to prevent their falling into the hands of the English 1778. The cultivation is now checked by insufficiency of labor. On the cession of Mauritius, the Seychelles were finally taken into possession by Great Britain. The islands produce a large quantity of timber suitable for ship-building purposes; and the Seychelles cocoa-nut, indigenous only in the Seychelles, and whose nuts, leaves, etc., are applied to a great variety of domestic purposes by the natives. Sugar is cultivated to a small extent. Cotton flourishes here, but its cultivation has declined since the abolition of slavery. The chocolate plant and vanilla are grown, and tortoise-shell is among articles of commerce. Pop. 19,237. See Sir Edward Belcher's *Account of the Seychelles;* Owen's *Voyage of H. M. S. Leven and Barracouta;* Horne's *Report on the Seychelles Islands* (1875).

SEYMOUR: Conn.; town in New Haven co.; near the

junction of Bladen, Little, and Naugatuck rivers, and on the New York, New Haven & Hartford railroad; 9 m. n.w. of New Haven. Seymour is one of the oldest towns of Connecticut. The manufacturing of woolen goods was begun here the last of the 18th c. In 1803 General David Humphreys (who was the first to bring merino sheep into the United States) bought the woolen mill and enlarged it to what was then called a large factory. In 1836 the place was incorporated under the name of Humphreysville, and in 1850 it was incorporated as a town under its present name. The chief manufactures are woolen goods, mechanics' tools, agricultural implements, nails, pins, paper, and rubber. There are five churches, a high school, public graded schools, private schools, and a public library. Pop. (1900) 3,541; (1910) 4,786.

SEYMOUR: Ind.; city in Jackson co.; on the Pittsburg, C., C. & St. L., the Baltimore & O. S. W., the Southern Indiana, and the Evansville & T. H. railroads; about 55 m. s. of Indianapolis and 50 m. n. of Louisville, Ky. It is in an agricultural and stock-raising region, and has considerable manufacturing interests. The chief industrial establishments are woolen mills, foundry, rolling and planing mills, cradle factories, harness works, carriage works, and furniture factory. A number of men are employed in the machine shops of the Ohio and Mississippi division of the Baltimore & Ohio Southwestern railroad. There is considerable trade in the manufactures, live-stock, farm, and dairy products. There are 11 churches, the Shields high school, Saint Ambrose Academy, public and parish elementary schools. The two national banks have a combined capital of $200,000. Pop. (1900) 6,445; (1910) 6,305.

SEYMOUR, *sē'mėr*, FAMILY OF: family whose history is interwoven with that of England, originally settled at St. Maur—whence its name—in Normandy. Going to England, the Seymours obtained lands in Monmouthshire as early as the 13th c. They acquired estates at Hatch Beauchamp, Somersetshire, by marrying an heiress of the Beauchamps early in the 15th c.—In 1497 the head of the family, Sir John Seymour, was employed in suppressing the insurrection of Lord Audley and the Cornish rebels, and subsequently accompanied King Henry VIII. to his wars in France and to the Field of the Cloth of Gold. Of the issue of this worthy knight, one daughter became wife of Henry VIII., and mother of Edward VI.; one son, Thomas, created Lord Seymour of Sudeley, became lord high admiral of England, and the second husband of Henry's widow (Catherine Parr), and ended his life on the scaffold, being attainted of high treason.—Sir John's eldest son, Edward, who held many high positions in the court of Henry, was created Lord Seymour of Hache, and Duke of Somerset 1546-7. He had been sent into France by Henry to settle the disputed question of

the border of the English possessions there, and secured the confidence of the king so far that he was left by him one of his executors and one of the council of the young Prince Edward. He was subsequently made lord high treasurer, and eventually 'protector and governor of the king and his realms.' His subsequent fall, after a two years' tenure of his almost regal power, by the influence of Dudley, Earl of Warwick and Duke of Northumberland, was followed by attainder of his honors, which was not reversed for more than a century.—The eldest son of the Protector by his second marriage, being created by Queen Elizabeth Earl of Hertford, married Lady Catharine Grey, grandniece of Henry VIII., sister of the unfortunate Lady Jane Grey—a marriage which entailed on him long imprisonment and a heavy fine.—His grandson, who succeeded him in the earldom of Hertford, also was sent to prison in the Tower of London for marrying Lady Arabella Stuart, cousin of James I. of England; but subsequently, taking conspicuous part in the royal cause in the civil wars, obtained in his own favor a reversal of his ancestor's attainder, and 1660 took his seat in the house of peers as second Duke of Somerset, though the descendants of the first duke by his first marriage were then living.—He died 1675, and his ducal title passed to a cousin, on whose death it was inherited by Charles Seymour, known in history as the 'proud Duke of Somerset,' a nobleman whose style of living was ostentatious and haughty in the extreme, and who filled several high posts in the courts of Charles II., William III., and Anne. He married the heiress of the Percies, by whom he had a son, Algernon, 7th duke, who was created Earl of Northumberland, with remainder to his son-in-law, Sir Hugh Smithson, ancestor of the present Percy line.—On the death of this duke, a curious peerage case arose, the title being claimed by the descendants of the first duke by his first marriage, on the failure of the younger branch; and the attorney-general having reported in favor of the claim, Sir Edward Seymour took his seat in the house of peers as 8th duke.

SEYMOUR, *sē'mėr*, GEORGE FRANKLIN, D.D., LL.D.: Protestant Episcopal bishop; b. New York, 1829, Jan. 5; d. 1906. He graduated at Columbia College 1850; and studied theology at the General Theological Seminary in New York. His first pastorate was at Annandale, N. Y., where he built a church and founded a training school for candidates for the ministry, 1855-61. Then he was rector of churches in New York and Brooklyn till 1865, when he became professor of church history in the General Theological Seminary. He was elected bishop of Illinois 1874, but the general convention of the Protestant Episcopal Church, then in session, refused to approve the act. Having been elected bishop of Springfield (Ill.) 1878, he was duly consecrated. He was classed as holding high-church views, and is a pronounced 'ritualist.'

He advocated a change in the style of his church from 'Protestant Episcopal Church' to 'Church of the United States.' He wrote *Modern Romanism not Christianity* (1888); *Marriage and Divorce* (1893); *The Church Idea of the Family* (1899); *Sacraments and Principles of the Church* (1 vol. 1903); etc.

SEY'MOUR, HORATIO, LL.D.: statesman: 1810, May 31—1886, Feb. 12; b. Pompey Hill, N. Y.; son of Henry Seymour. He was educated at academies in his native state and at a military school at Middletown, Conn., and after studying law was admitted to the bar, but never practiced. He was military secretary to Governor Marcy 1833-39, was elected by democrats to the state assembly 1841, was chosen mayor of Utica 1842, the following year was re-elected to the assembly, and soon became prominent in that body, was speaker of the legislature 1845, was candidate for governor 1850, and was defeated by 262 votes, but was elected governor 1852 by a majority of more than 22,000. His veto of a prohibitory law which was afterward passed and was declared unconstitutional, caused his defeat as candidate for governor 1854. He declined the offer of a foreign mission 1857, was elected governor 1862, and was severely criticised for his course in the bloody draft riots in New York 1863, July, as also for general lack of zeal in the national cause. In 1864 he received the thanks of a republican legislature for securing a correction of errors in the enrolment of the state. He presided over the democratic national convention 1864, was defeated for governor in the same year, and against his judgment was nominated by the democrats 1868 for the presidency. He received 80 electoral votes, to 214 for Gen. Grant. He was interested in agriculture, and was prominent in developing the canal system of New York. He died at Utica, N. Y. Governor Seymour was held in high honor as a leader and counselor in the democratic party.

SEYMOUR, THOMAS HART: American legislator and diplomat: b. Hartford, Conn., 1808; d. there 1868, Sept. 3. He was educated at a military academy at Middletown, Conn., and was editor of *The Jeffersonian Democrat* in 1837. He was a member of Congress in 1843-5, served through the Mexican War and in 1850-3 was governor of Connecticut. He was United States minister to Russia in 1853-7.

SEY'MOUR, TRUMAN: 1824, Sept. 25—1891, Oct. 30; b. Burlington, Vt.: soldier. He graduated at West Point 1846; served in Mexico; was assistant professor at West Point 1850-53; fought the Seminoles in Florida 1856-58, and aided in the defense of Fort Sumter 1861. He was in many important battles of the civil war, including those of Malvern Hill, South Mountain, and Antietam; led the attack on Fort Wagner 1863; captured Jacksonville, Fla., 1864; was taken prisoner at the battle of the Wilderness, and after his exchange led a division in the Richmond campaign and was present at Lee's surrender. He

was made brig.gen. vols. 1862; received several brevets, including those of maj.gen. vols. and brig.gen. U. S. army; was mustered out of the vol. service 1865, Aug. 24, and was made major U. S. army 1866. After commanding at various points, he retired 1876, Nov. 1, and afterward removed to Florence, Italy.

SEYNE, La, *lâ sān:* a seaport of France, on the shore of the Mediterranean, dept. of Var, three m. s.w. of Toulon. Pop. 10,000.

SEZZE, *sĕt'sā*, or Sezza, *sĕt'sâ:* city of Italy, province of Rome. There are remains of a Cyclopean wall surrounding the rock on which it stands. Pop. 6,600.

SFAX, *sfâks*, or Sfakes, *sfâ'kĕs:* chief town and port of s. Tunis, 150 m. s. of the town of Tunis, with which it is connected by telegraph. There is trade in dates, cloth, olive oil, esparto grass, and jessamine and rose oil. Pop. 40,000, of whom 2,000 are Jews.

SFORZA, *sfort'sâ:* renowned Italian family, prominent in the affairs of Italy during the 15th and 16th c., swaying the destinies of n. Italy for many years, and allying itself with the first sovereign houses in Europe.—Its founder was a peasant of Cotignola, in the Romagna, by name *Giacomo*, or *Muzio* (sometimes combined by historians into *Giacomuzzo*) *Attendolo* (b. 1369), who deserted his trade of wood-cutting to become a 'condottiere,' and by his intelligence and courage rose to a high position in the band to which he belonged. Count Alberigo de Barbiano, founder of Italian 'condottierism,' bestowed on him, on account of his prowess, the name of Sforza (Ital. 'the forcer'); and such was his reputation among his comrades that he speedily found himself the independent leader of a band of condottieri, and offered his services to the king of Naples. Queen Joanna II. made him constable of that kingdom, and in exercise of his office, he chased away the Aragonese, and others, who attempted to deprive her of her dominions; but dying 1424, Jan. 4, he left his devoted followers to the chieftainship of his natural son, Francesco S., then 23 years of age, who was as brave and enterprising as himself.—Francesco, as was the custom of the time, sold his sword to the highest bidder, and without the slightest scruple fought for or against the pope, Milan, Venice, and Florence. He invented an improved system of tactics, and it soon came to be taken for granted that victory was certain for the party which he supported. It was thus no great act of condescension in the Duke of Milan, the haughty visconti, to confer on him the hand of his daughter, Bianca, with Cremona and Pontremoli as dowry, and the promise of succeeding to the duchy itself. Meantime, S. took the march of Ancona from the pope (1434), added to it Pesaro (1443), and by a judicious combination of force and stratagem, obtained his elevation to the dukedom of Milan, 1450, Feb. 26, after the decease of his father-in-law. He solidly established his authority over all Lombardy, and several districts s. of the Po; acquired the esteem of Louis XI., who gave up to him Savona and Genoa: and

after gaining the universal love of his subjects, died 1466, Mar. 8. Though uninstructed, he possessed considerable eloquence, and loved and protected letters. The successors to his power possessed few or none of his distinguished talents.—His son, GALEAZZO-MARIA S. (ruled 1466–76) was a tyrant, gloating over the torments of his victims, and a monster of debauchery, prodigality, and ferocity, without a single redeeming feature in his character. He was assassinated (Dec. 26) at the porch of the cathedral of Milan.—His son, GIOVANNI-GALEAZZO S. (ruled 1476–94) succeeded, under the regency of his mother, Bona of Savoy, who held the reins of government with a firm hand. But she was forced to give up (1480) her able coadjutor, Simonetta, to the vengeance of her brother-in-law, Lodovico Maria, surnamed 'the Moor,' from his dark complexion; and three days after Simonetta's execution, the ambitious Lodovico banished Bona herself, and assumed the regency. Finding the young duke in his way, Lodovico put him and his wife, Isabella of Calabria, in prison, and was immediately threatened with attack by the king of Naples, a danger which he attempted to ward off by giving his daughter, Bianca, with a dowry of 400,000 ducats to Emperor Maximilian I., and by stirring up Charles VIII. of France to assert his claims to Naples. Soon afterward, Duke Giovanni-Galeazzo died, poisoned, as some believe, by his uncle, 1494, Oct. 20.—LODOVICO-MARIA (ruled 1494–1500) obtained his investiture as duke, and becoming alarmed at the rapid progress of the French in Italy, he joined the league against them, and was rewarded for his perfidy by being driven from his duchy, which was seized by the troops of Louis XII. (1499). The following year he made an ineffectual attempt to regain possession, was made prisoner, and carried to France, where he died 1508. He possessed great talents, combined unfortunately with a low morality, which led him to value astuteness more than every other quality; but his encouragement of letters and of the fine arts, will preserve his name to posterity.—His eldest son, MASSIMILIANO S. (ruled 1512–15), regained the duchy of Milan after the reverses suffered by Louis XII., and with the aid of the Swiss steadily repulsed the various energetic attempts of the French to recover it; but after the battle of Marignan (1515), he abandoned his rights to the French for a pension of 30,000 ducats, glad to be free from the insolence and exactions of his allies, and the attacks of his enemies.—His brother, FRANCESCO-MARIA S., succeeded nominally to the Milanese after the battle of Pavia; but he was a mere puppet in the hands of Charles V., and on his death, 1535, Oct. 24, and the extinction of the main line of the house of S., the duchy was quietly swallowed up by Austria. The lords of Pesaro (extinct 1515), the Counts of Santa-Fiora, in Tuscany, still existing, and the Dukes of Sforza-Cesarini, descend from collateral branches of the family.

SFORZATO, ad. *sfŏrt-zâ'tō*, or SFORZANDO, *sfŏrt-zăn'dō* [It., forced, forcing]: in *music*, with force; louder than the rest—generally contracted *sf.*; and placed over or under the note which it relates to. Its higher degree is indicated by *sff*, or *sforzato assai*.

SFREGAZZI, n. *sfrā-găts'ē* [It *sfreggare*, to rub—from L. *ex*, out; *frico*, I rub]: in *art*, a term applied to a mode of glazing adopted by Titian and other old masters for soft shadows of flesh, etc., and consisting in dipping the finger into the color, and drawing it once along the surface to be painted with an even movement.

SFUMATO, a. *sfû-mâ'tō* [It., smoky]: in *painting*, having the tints so blended that the outline is scarcely perceptible, the whole presenting an indistinct misty appearance.

SGRAFFITTO, a. *sgrâf-fē'tō*, or SGRAFFIATO, a. *sgrâf-fī-â tō* [It., scratched]: applied to a kind of painting in which a ground of dark stucco is covered with a white coat, which last being partly scraped away, in forming design, the black ground appears and forms the shadows.

'S GRAVESANDE, *sgrâ-vĕh-sân'dĕh*, WILLEM JAKOB VAN: 1688, Sep. 27—1742, Feb. 28; b. Holland. He was educated for the law, and afterward studied philosophy and other branches at Leyden and Leipsic; for 8 years was editor of the *Journal Littéraire*, for which he wrote valuable mathematical and philosophical papers, was prof. of math. and astron. in the Univ. of Leyden 1717–34, and from the latter year till his death prof. of philos. Among his works were *Physices Elementa Mathematica* (1720); and *Introductio ad Philosophiam* (1736).

SHABBY, a. *shăb'bĭ* [see SCAB, *shabby* being a doublet of *scabby*: Dut. *schabben*, to scratch, to rub; *schabbe*, a scab; *schabbig*, shabby]: damaged or faded; torn or much worn, as a coat or other part of the attire; mean in appearance or conduct; contemptible; low; paltry; despicable. SHAB'BILY, ad. *-bĭ-lĭ*. SHAB'BINESS, n. *-nĕs*, the quality of being shabby; raggedness.

SHABRACK, n. *shăb'răk* [Hung. *csabrag*; Turk. *tshâprâk*]: the cloth furniture of a cavalry officer's charger.

SHACK, n. *shăk* [Scot. *shag*, the refuse of barley (see also SHAG and SHAKE)]: in *provincial usage*, shaken grain remaining on the ground after the gleaning is over; liberty of free winter pasturage from harvest to seed-time, according to ancient custom; a tramp or sturdy beggar: V. to shed, as corn in the harvest-field; to feed in stubble; to wander, as a vagabond. SHACK'ING, imp. SHACKED, pp. *shăkt*. TO GO ASHACK, to feed at large.

SHACKLE, n. *shăk'l* [O. Dut. *schackel*, the link of a chain; *schakelen*, to link together: Dan. *skagle*, a trace for a carriage: Sw. *skakel*, the loose shaft of a carriage—the original sense being 'a loose bond']: anything which confines or hinders the free use of the limbs, as fetters, chains, or handcuffs, usually in the plu.; that which obstructs or embarrasses free action: V. to fetter, to bind. SHACK'LING imp. SHACK'LED, pp. *-ld*.

SHAD: fish of the same genus (*Clupea*) as herrings and alewives, and belonging to the family *Clupeidæ* (q.v.). The best known is the AMERICAN or WHITE S. (*C. sapidissima*), formerly confounded with *C. finata* of England, from which it differs in not having the snout bifid. It has no spots on the sides, and the scales are large and silvery. The average weight is 4 lbs. occasionally 7 or 8 lbs, and there are traditions of 11 to 14 lbs. Its range is from the Gulf of St. Lawrence to Florida, and it has been introduced artificially into the Mississippi valley and Pacific coast rivers. There is occasional coastwise migration of this species, as shown by occurrence of the southern variety, with black-tipped fins, as far n. as Delaware Bay. But the most of the movements are from deep sea into rivers, regulated by a water temperature of 60° to 70° F., as the season advances, the spawning being in the higher temperature, while the half-grown S. do not ascend further when 60° is reached. The mature 'spent' adults sometimes remain; the young, 2 or 3 in. in length, leave late in autumn. The number of eggs in a ripe roe S. averages 25,000, rarely (in large individuals) reaching three or four times that number. The mature S., in fresh water, seems to take little or no food; hence it seldom responds to bait. This species is delicate and delicious food.—The HICKORY S. or MATTOWACCA (*C. mediocris*), known also as Long Island or Staten Island S., and in the south as the Tailor S., received the first name probably from its stripes, resembling those of the coarse cloth called 'hickory' in the south, where the fish has some esteem, and is often palmed off as White S. Occasional in n. markets in fall and winter, it is not much valued.—The INLAND ALEWIFE or Skipjack (*C. chrysocloris*), mostly of western rivers and lakes, is sometimes called S., but is worthless.—The MUD-SHAD (*Dorosoma cepedianum*), otherwise called Winter S., Stink S., White-eyed S., is in Fla. known as Gizzard S., from the resemblance of its stomach to that of a fowl; it is eaten by negroes, and is sometimes made into guano; in the lake region it has a little sale when fresh, or split and dried, as 'Lake Shad.'

Common Shad of Europe.

SHAD-BUSH (*Amelanchier Canadensis*): shrub or tree of the family *Rosaceæ;* same as June-berry (q.v.), and Service-berry: said to be named from its flowering at the time when shad appear in the Connecticut river, April and May. It varies much, the principal varieties being *botryapium*, 10-30 ft. high, with long drooping flowers; *rotundifolia*, with broader leaves: *oblongifolia*, the young branches white-downy; *alnifolia* (alder-leaved) of the west; and *oligocarpa*, with 2-4 flowered racemes, occurring in mountain swamps—the last three shrubs.

SHADDOCK, n. *shăd-dŏk* [after Capt. *Shaddock,* an Englishman who introduced it into the W. Indies], (*Citrus decumana:* see CITRUS): large variety of orange—tree, which, like the other species of the same genus, is a native of the E. Indies, long cultivated in s. Europe. The tree is rather more tender than the orange. It is readily distinguished from most of its congeners by its large leaves and broad-winged leaf-stalk; it has very large white flowers, and the fruit is also very large, sometimes weighing 10, or even 14 lbs., roundish, pale yellow; the rind thick, white and spongy within, bitter; the pulp greenish and watery, subacid, and subaromatic. It is a pleasant, cooling fruit, used for preserves.

Shaddock Tree (*Citrus decumana*).

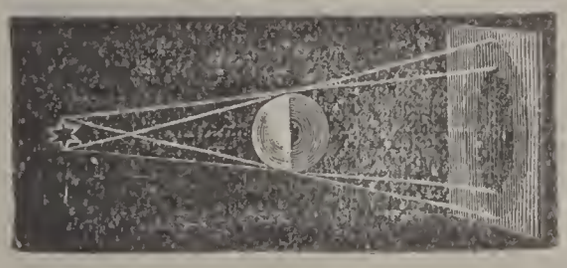
SHADE, n. *shād* [Goth. *skadus;* AS. *sceadu;* Dut. *schaduw*, shade: Ir. and Gael. *sgath*, shadow, shelter: Gr. *skia*, shade]: obscurity or darkening resulting from the partial interruption of the rays of light (see SHADOW): gloom; any obscure or partially dark place; anything which intercepts light or heat: a glass cover for inclosing and protecting time-pieces and valuable ornaments, etc.; a screen; shelter; protection: the varying dark parts of a picture; a minute difference; a ghost; a disembodied spirit. SHADES, plu. *shādz*, the lower regions; deep obscurity; Orcus. SHADE, v. to screen from light or heat; to shelter; to protect; to paint with darker or more obscure colors; to darken; to obscure. SHADING, imp. *shā'dĭng:* N. the act or operation of obscuring or darkening; the style in which such is done. SHA'DED, pp. SHA'DER, n. *-dĕr*, one who or that which shades. SHA'DY, a. *-dĭ*, sheltered, as from the heat of the sun; abounding with shades; *familiarly*, equivocal; suspicious. SHA'DILY, ad. *-dĭ-lĭ*. SHA'DINESS, n. *-nĕs*, the state of being shady. SHADELESS, a. *shād'lĕs*, having little or no shade. SHADY SIDE OF FORTY, more than forty.

SHADOOF, or SHADUF, n. *sha-dōf'* [Arab. *shadūf*]: oldest-known contrivance for elevating water, being found represented on monuments as early as B.C. 1432. It is still very common along the Nile, being used for irrigation. It consists of a long stout pole or rod suspended on a frame at about one-fifth of its length from the end. The short end is weighted to act as a counterpoise of a lever, and from the long end a bucket of leather or earthenware is suspended by a rope. The worker dips the bucket in the river, and,

aided by the counterpoising weight, raises it, and empties the water into a hole dug in the bank, from which a channel conducts it to the lands to be irrigated.

SHADOW, n. *shăd'ō* [see SHADE]: the shade or partial darkness of a definite form made on one side of a body, caused by a bright light falling upon the opposite side; that portion of space or a surface from which light is intercepted by some opaque body (see below): obscurity; shelter, a slight or faint appearance; something existing only in appearance: a close subservient companion or follower: type or mystical representation: used to denote a person or animal thin or emaciated to an extraordinary degree: likeness reflected from a mirror: V. to cloud or darken; to conceal under cover; to screen; to protect; to represent faintly or imperfectly; to paint in obscure colors; to represent typically. SHAD'OWING, imp.: ADJ. sheltering; representing by a faint or imperfect resemblance: N. gradation of light or color; a typifying. SHAD'OWED, pp. *-ōd:* ADJ. covered; clouded. SHAD'OWY, a. *-ō-ĭ*, full of shade; dark; gloomy; faintly light; unsubstantial. SHAD'OWINESS, n. *-ĭ-nĕs*, the state of being shadowy or unsubstantial. SHAD'OWLESS, a. *-lĕs*, having no shadow. SHADOW OF DEATH, the near and felt approach of death; a time of great darkness and trouble.

SHAD'OW: portion of space from which light is debarred by interposition of an opaque body. If the luminous body be too near, or too large to be considered a mere point, then each atom of the light-giving surface throws its own shadow independent of the others. There are thus in reality a multiplicity of shadows overlapping each other, and forming what in common parlance is 'a' shadow of the opaque body, darkest at those places where all the separate shadows overlap each other, and lighter as it gradually falls beyond the limits of more and more of these separate shadows: see PENUMBRA. The depth of a shadow depends from mere force of contrast on the intensity of the light around it; it depends much also on the nearness of the object, as compared with its size, to the surface on which the shadow is thrown; for the rays of light by their properties of reflection, refraction, and dispersion tend to bend 'round' the opaque object, and the increase of distance between an object and its shadow allows more scope for this action.



Shadow.

SHADRACH, n. *shăd'răk* [from *Shadrach*, one of the three on whose bodies the fire of the furnace, Dan. iii. 26, 27, had no power]. mass of iron in which the operation of smelting has failed of its intended effect.

SHADWELL, *shăd'wĕl,* THOMAS: dramatic writer of some note in his day, though remembered only as the 'Mac-Flecknoe' of Dryden's satire: 1640-92; b. Norfolk, England. He was educated for the law, but deserted it, and betook himself to literature. His first comedy, *The Sullen Lovers* (1668), had great success, and he continued from year to year to entertain the town with a succession of similar pieces, a complete edition of which was published after his death, 4 vols. 12 mo. The immortality which these must have failed to achieve for him, he was fated to attain in a way somewhat less desirable. With Dryden he seems, in the earlier portion of his career, to have been on terms of friendly intimacy; but literary jealousies divided them, and the quondam friend became a favorite butt for the shafts of Dryden's deathless ridicule. Though Shadwell's works—hasty and careless as they are—exhibit lively talent and considerable comic force, nearly all that the literary world now knows of him is that 'Shadwell never deviates into sense.' It might a little console him, under the satire of his enemy, that he succeeded him in the post of poet-laureate, which in 1688 it became necessary for Dryden to resign. Shadwell did not long enjoy it, however, as in 1692 he died, it is said of an overdose of laudanum, a drug in which he was wont to indulge himself.

SHAFÆITES, *shăf'ē-īts,* or SHAFIITES, *shăf'ĭ-īts:* one of the four principal sects of the Sunnites (q.v.), or 'orthodox' Muslims. Its name is received from its founder, Abu Abdallah Mohammed Ibn Idris, called Al-Shafei, from one of his ancestors, descendant of Mohammed's grandfather.

SHAFF'NER, TALIAFERRO PRESTON: American inventor: b. Smithfield, Va., 1818; d. Troy, N. Y., 1881, Dec. 11. He studied law and was admitted to the bar, but practised little, his attention being largely absorbed by inventions. In the early days of the telegraph he was an associate of Samuel F. B. Morse. He built the line from Louisville, Ky., to New Orleans and that from Saint Louis to Jefferson City in 1851. He projected a North Atlantic cable that should touch Labrador, Greenland, and Iceland, and secured a number of patents for the use of high explosives in blasting. During the Dano-Prussian war of 1861 he was in the service of Denmark. He published the *Telegraph Companion: devoted to the Science and Art of the Morse American Telegraph* (1855); *The Telegraph Manual* (1859); *The Secession War in America* (1862); *History of America* (1863); *Odd Fellowship* (1875).

SHAFT, n. *shăft* [Dut. *schaft,* a stalk, a rod: Dan. *skaft,* a handle, haft: Icel. *skapt,* the shaft of a spear: AS. *sceaft,* a shaft]: something long and straight; a missile weapon, as an arrow; the handle of a weapon: the part of a column extending from the base to the capital

(see below): pit or entrance to a mine when perpendicular or nearly so: one of the long poles between a pair of which a horse is harnessed to a carriage. SHAFT'-ED, a. having a handle or shaft.

SHAFT: body of a column, extending between the base and capital. In Gothic architecture, the term is applied to the small columns clustered round piers, or in the jambs of doors and windows. In the early styles, the shafts are frequently of finer material than the pier, such as Purbeck marble, and polished and banded. In later examples, the shaft is generally attached, and of the same piece as the pier.

SHAFTER, *shăf'tėr*, WILLIAM RUFUS: American military officer: b. Galesburg, Mich., 1835, Oct. 16; d. near Bakersfield, Cal., 1906, Nov. 12. At the outbreak of the civil war he entered the 7th Michigan Infantry. He participated in the battles of Fair Oaks, Savage Station, Glendale and Malvern Hill; was appointed major 1862, Sept. 5; was taken prisoner at Thompson's Station, Tenn., in 1863, Mar., and exchanged in May of the same year; was made lieutenant-colonel 1863, June 5, and became colonel of the 17th United States colored troops 1864, Apr. 19; brevet brigadier-general of volunteers for gallant and meritorious services during the war; and was mustered out of the volunteer service 1865, Nov. 2. He entered the regular army and became lieutenant-colonel of the 41st Infantry 1867, Jan. 26; assigned to the 24th Infantry 1869, Apr. 14; colonel of 1st Infantry 1879, Mar. 4; and brigadier-general 1897, May 3. On the breaking out of the Spanish-American war he was given command of the army mobilized for the invasion of Cuba; his first decisive move was the landing of 16,000 men in Cuba in about 12 hours without an accident. He conducted the military operations resulting in the surrender of Santiago de Cuba. After the war he commanded the department of California and Columbia in 1899-1901, and was retired 1901, June 3.

SHAFTESBURY, *shăfts'bėr-ĭ*, ANTHONY ASHLEY COOPER, first Earl of: English statesman and philanthropist: 1621, July 22—1683, Jan. 21; b. Wimborne St. Giles, Dorset; descended from a family intimately associated with the political history and literature of England. Sir John Cooper of Rockbourne, Hampshire, married Anne, daughter and sole heiress of Sir Anthony Ashley of Wimborne St. Giles, Dorsetshire, secretary-at-war in the reign of Queen Elizabeth. Their eldest son, Sir Anthony Ashley Cooper, was active in public affairs during the civil wars. He first espoused the cause of royalty; he then became one of the most eminent parliamentary leaders in the council, and not the least active in the field. When he saw that the restoration was inevitable, he took so prominent a part in bringing back Charles II. that he was raised to the peerage as Baron

Ashley. He was a member of the justly infamous 'Cabal' ministry, and was afterward appointed lord chancellor, with the earldom of Shaftesbury. He was the 'Achitophel' of Dryden, by whom his character is drawn with truth and power. His life was crowded with political activity and management, until his 'fiery soul' wore out his small and fragile body. He will be honored for all time by men of English race and descent as the author of the Habeas Corpus Act. He also first introduced a bill rendering the judges independent of the crown.—He was grandfather of Anthony Ashley Cooper, third Earl of Shaftesbury, who obtained from Voltaire the questionable praise of being the boldest of English philosophers.

SHAFTES'BURY, ANTHONY ASHLEY COOPER, third Earl of: 1671, Feb. 26—1713, Feb. 4 (new style). John Locke superintended his education. At 11 years of age he could read Latin and Greek. After schooling at Winchester and an interval of travel, he was elected to parliament from Poole, and in a speech on trials for treason made the famous appeal from his own diffident hesitation, in favor of allowing counsel to the accused. He ignored party to uphold individual liberty and rights of parliament. Succeeding to the earlship, about 1698, he was an active whig, and was offered the secretaryship of state, but, on the accession of Queen Anne, retired and lived the life of an invalid, dying in Italy. He was a pure, amiable, and benevolent man, and contrary to prevalent impressions, a reverent attendant of the English Church. Dissenting from some doctrines, he treated them in what he esteemed a style of *bonhomie* raillery. His ethical system, characterized by the 'taste' or 'moral sense' phraseology, anticipates the doctrine, more elaborately expounded by Hutcheson (q.v.). It was the ethics of an æsthetic gentleman. His natural theology was only optimism unqualified, and was versified in Pope's *Essay on Man*. Shaftesbury's well-meaning but superficial philosophies came to be a denounced heresy, chiefly because they were caught up and lauded by continental deists as 'the divine cultus of beauty,' the 'new-born Hellenism.' His various anonymous essays, on wit, humor, morals, etc., were by him collected in 3 volumes entitled *Characteristics of Men, Manners, Opinions, Times* (1711). He wrote also some essays on art. His *Letters to a Young Man in the University* were published 1716; others, with Letters of Locke and Sidney, 1830.

SHAFTES'BURY, ANTHONY ASHLEY COOPER, seventh Earl of: Christian philanthropist: 1801, Apr. 28—1885, Oct. 1; b. Grosvenor Square, London; son of Cropley, 6th earl, and of Anna, daughter of the 3d Duke of Marlborough. He was sent to Harrow, and thence to Christ Church, Oxford, where he obtained a first-class degree in classics 1822. He represented the borough of Woodstock 1826-30; the county of Dorset (in which the family

estates are situated) 1831-46; and the city of Bath 1847-51, when he succeeded to the earldom. During his long career in the lower house, he held one or two subordinate posts. He is renowned and honored for his attempts to improve the social condition of the laboring classes. As he belonged to the conservative party and represented an agricultural county, the manufacturers, and their organs in the press, received his allegations respecting the condition of their operatives in a hostile spirit, and retorted that the wages of families engaged in factories amounted to twice and three times the sum paid to the Dorsetshire laborers. Yet Lord Ashley returned again and again to the charge; and on the death of Mr. Sadler, M.P., took charge of the Ten Hours' Bill. The manufacturers declared with alarm that any reduction in the hours of labor would be fatal to British manufacturing supremacy. Successive governments naturally believed these prophecies, and almost all the leading statesmen of the day opposed the Ten Hours' Bill. But public opinion declared in favor of a limitation of the hours of labor. Lord Ashley carried his bill through parliament, and had the satisfaction of knowing that afterward the opponents of the measure admitted without exception that it was an act of wise and beneficent legislation, and that their alarms were groundless. When he visited the manufacturing districts, he was honored with an enthusiastic ovation. He refused to join Sir Robert Peel's administration 1841, because that statesman refused to countenance the Ten Hours' Bill. In 1846 he supported Sir Robert Peel in his proposal to repeal the Corn Laws, an act which cost him his seat for Dorsetshire. When he successfully contested Bath against Mr. Roebuck 1847, he appeared on the field of politics as a 'liberal conservative.' After his accession to the earldom Shaftesbury became more prominent in connection with various religious, social, and philanthropic societies—so numerous that a list of the associations with which he was in some way officially concerned would include almost every scheme having for its object the physical, moral, and spiritual improvement of society. He gave liberally not only of his money, but also of his time and thought, and of his earnest personal effort by day, and often by night in the worst parts of London, for encouragement of the abject, instruction of the ignorant, and reclamation of the vicious. He belonged to the Evangelical party in the Church of England, and was a prominent member of the chief church societies. He married a daughter of the fifth Earl Cowper, and was thus a connection by marriage of the late Viscount Palmerston, whose government he steadily supported, and many of whose ecclesiastical appointments and promotions of Evangelical clergymen were attributed to his influence. He followed up the Ten Hours' Bill by other measures regulating defective workshops and fac-

tories night work, and treatment of children by their employers. He died at Folkestone.

SHAFTMENT, n. *shăft'mĕnt* [AS. *scaftmund—scæft,* a shaft; *mŭnd,* a hand]: measure of about 6 inches; a span.

SHAG, n. *shăg* [AS. *sceacga,* a bush of hair, what is rough and shaggy: Scot. *shag,* the refuse of barley: Icel. *skegg,* a beard—from *skaga,* to project, to jut out: Dan. *skjæg,* a beard, awn]: coarse hair or nap; a kind of cloth having a long, coarse, woolly nap; tobacco-leaves cut into shreds: ADJ. in *OE.,* hairy; shaggy: V. in *OE.,* to make shaggy or rough; to deform. SHAG'GING, imp. SHAGGED, pp. *shăgd.* SHAG'GY, a. *-gĭ,* or SHAG'GED, a. *-gĕd,* covered with long hair or wool; rough; rugged. SHAG'GINESS, n. *-gĭ-nĕs,* or SHAG'GEDNESS, n. *-gĕd-nĕs,* the state of being shagged or shaggy.

SHAG. See CORMORANT.

SHAGREEN, n. *shă-grēn'* [F. *chagrin;* It. *zigrino,* she-green: Turk. *saghri,* the rump of a horse or an ass, the rough skin of certain fish]: generally, the rough prickly skins of sharks and dog-fish prepared as leather, used in covering cases, in polishing, etc. SHAGREEN', a. or SHAGREENED', a. *-grēnd,* made or covered with shagreen. See CHAGRIN. Oriental shagreen, formerly in great repute, consists of portions of the skins of horses, asses, camels, and oxen, the part used being strips taken from head to tail along the centre of the back. These strips are prepared by soaking in water and currying; then laid on the ground, and the seeds of *Chenopodium album* are sprinkled over them; a board or piece of felt is then placed on the seeds, and by pressure the hard seeds are forced deeply into the skin, which, when dried and further prepared, presents granulations caused by the pressure of the seeds; and is finally dyed of various colors, most frequently green.

SHAH, n. *shâ* [Pers. *shah,* a king, a prince]: general title of the supreme ruler in Persia, also in Afghanistan, and some other countries of s. and central Asia. The sovereign, however, may, and frequently does, decline the title, assuming in its place that of *Khan* (q.v.), an inferior and more common appellation. The same title can be assumed by any of the shah's sons: and on all the princes of the blood the cognomen *Shah-zadeh* is bestowed.

SHAHAPTIAN INDIANS: a linguistic stock of North American Indians, the name of which is adapted from the Kootenay name of the Nez Percés, one of its principal tribes. The divisions of the stock occupied a large section of country along the Columbia and its tributaries in what is now n.e. Oregon, s.e. Washington, and s.w. Idaho, extending from about lon. 114° 30′ to 121°, and between lat. 44° and 46°.

The principal tribes or bands of the stock are: Yakima, Nez Percé (Chopunnish), Kiskitat, Paloos, Tenaino,

Tyigh, Umatilla, Wallawalla, and Tukspush or John Day Indians.

SHAHI, n. *shâ'hĭ* [Pers.]: Persian copper coin of the value of 1¼ cents.

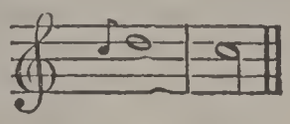
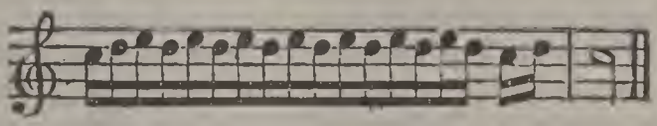
SHAH-JAHAN, *shâ-ja-hân'*, 'King of the World': title assumed on accession to the throne by Khorrum Shah, third son of Selim Jahan-Ghir, and fifth Mogul emperor of Delhi (reigned 1627-58); d. 1666, Dec. He was during his father's reign employed in military expeditions against the Rajputs, the independent Mohammedan states of the Deccan, and the Afghan tribes around Candahar, in which he distinguished himself by bravery and military skill; but on his return, he was forced into rebellion (1623) by the intrigues of his enemies at court, and was still unreconciled to his father at his father's death 1627, when he was at once saluted as emperor by the nobles. At his accession, the empire had reached the summit of its greatness, but the causes which led to its rapid decline at the same time unmistakably showed themselves: the territory was too extensive for the system of government which was generally pursued by the Moguls; the discordant parts were unconnected by any bond of union; the supreme ruler was regarded in many provinces as a mere tax-collector; and with the thus necessary absence of any spirit of loyalty, insurrections were frequent in all the provinces. The chief events of Shah-Jahan's reign were—the war against the Deccan sovereignties, resulting in the complete destruction of the kingdom of Ahmednuggur (1631), and the subjugation (1636) of those of Beejapur and Golconda; an indecisive contest against the Uzbeks of Balkh (1644-47); two unsuccessful attempts to recover Candahar from the Persians; and a second successful war, conducted by his third son, Aurungzebe, against the Deccan princes (1655). But in 1657 the emperor fell dangerously ill, and his four sons, ambitious of attaining supreme power, immediately began to dispute regarding the succession: see AURUNGZEBE. Ultimately, Shah-Jahan was taken prisoner, and confined in the citadel of Agra till his death. Shah-Jahan united the voluptuous profligacy so common in eastern monarchs with great sagacity, and the strict administration of justice to Moslem and Hindu alike. In his later years he became avaricious, increased the taxes, and confiscated the property of his wealthier subjects on the slightest pretexts. The magnificence of his court was unequalled; the splendid 'peacock throne' was constructed by his orders at a cost reported about $35,000,000, and many magnificent public buildings executed under his direction remain as monuments of his greatness. Chief of these are the city of Shahjahanabad (Delhi), and the mausoleum of Taj Mahal (see AGRA). Yet so strict was his financial management that he left a well-appointed army of 200,000, and a treasury containing $120,000,000 to his son Aurungzebe.

SHAH NAMAH, the title of a celebrated history of the ancient Persian kings in about 60,000 distichs, written by order of Sultan Mahmud of Ghizni, in the space of 30 years. Another Shah Namah, in Turkish, comprises the history of all the ancient kings of the East, and was written by Firdusi Al-Thauil. Bajazet II., to whom the book was dedicated, ordered the author to reduce it from its original bulk of 300 vols. to 80. The mortified author preferred leaving the country, and emigrated to Khorassan, in Persia.

SHAIRP, *shärp,* JOHN CAMPBELL: 1819, July 30—1885, Sep. 18: b. Houstoun House, Linlithgowshire, Scotland. He was educated at Glasgow Univ. and Balliol Coll.; became asst. master at Rugby; prof. of humanity 1861, and principal 1868 in St. Andrew's Univ.; and prof. of poetry in Oxford 1877. Among his works are *Kilmahoe, with Other Poems* (1864); *Lectures on Culture and Religion* (1870); *The Poetic Interpretation of Nature* (1877); *Aspects of Poetry* (1881).

SHAKE, n. *shāk* [Icel. *skaka,* to shake, to jog: Dan. *skage,* to shift, veer]: rapid motion one way and another; a shock; concussion; agitation; a trembling or shivering, as from cold, fear, or sickness; motion of the hands when clasped in salutation; in *music,* the rapid up-and-down movement of the voice when dwelling on any particular note, but always within the compass of a tone (see below): fissure or rent in timber: V. to cause to move with short rapid vibrations; to give a wavering or trembling motion to; to throw or drive, followed by *down, from,* or *off;* to threaten to overthrow; to cause to waver or doubt; to lose firmness; to tremble; to totter; to shiver. SHA'KING, imp.: N. the act of shaking or agitating; a vibratory motion; a brandishing: concussion; the emaciation and weakness caused by disease or accident, said of a person recovering from illness. SHOOK, pt. *shûk,* did shake. SHAKEN, pp. *shā'kn.* SHA'KER, n. *-kĕr,* one who shakes. SHA'KY, a. *-kĭ,* loosely put together; ready to come to pieces; not in good health; not well prepared to undergo any particular trial or strain. SHAKEDOWN, a temporary substitute for a bed, as on a sofa or the floor. SHA'KERISM, n. *-ĭzm,* principles of the Shakers (q.v.). TO SHAKE HANDS WITH, to express goodwill at meeting or parting with a friend by shaking hands; to greet or bid farewell by the visible symbol of shaking hands; to become reconciled, as friends; to agree or contract with. NO GREAT SHAKES, *familiarly,* not worthy of attention; of no particular importance.—SYN. of 'shake, v.': to tremble; shudder; quiver; quake; agitate; toss; trill; shiver; vibrate; depress.

SHAKE, in Music: embellishment produced by the continued and rapid repetition of one note alternately with another either a whole tone or semitone above it. Its sign is *tr,* placed over or under the principal note,

the exact number of repetitions being indefinite. A shake is often preceded by an Appogiatura (q.v.), and is generally finished with a turn, as,  , played:  We may have shakes on two notes at once; and a series of shakes is called a chain of shakes.

SHAKERS, *shāk'ērz:* name commonly given to a small religious sect found mostly in the United States. The proper or official description of this sect is the United Society of Believers in Christ's Second Appearing; but its members seem to have accepted the designation Shakers, though it was applied originally in ridicule on account of certain rhythmical movements of the hands and arms which form part of the ceremonial of their worship. Though the Shaker Societies are found only in the United States, their creed had an English origin. The founder of the sect, in whose person they believe that Christ has appeared a second time, was an English woman, Ann Lee (1736, Feb. 29—1784, Sep. 8.; b. Manchester, England; d. Watervliet, N. Y.), who emigrated to New York with a small band of disciples, arriving 1774, May.

Ann Lee was the daughter of a blacksmith in Toad Lane, Manchester; a very poor man, who gave her no education, and sent her while a mere child to work in a cotton-mill. She seems to have been a hysterical girl, naturally excitable and ambitious, and to have always possessed, in virtue of her strong will and vehement temper, much influence over the people around her. She married, while very young, a blacksmith named Stanley. She had four children, all of whom died in infancy—to this, perhaps, may be ascribed the preference of the celibate to the married life, which she ultimately raised into a part of her religious system. At the age of 22 she became one of the earliest believers in a prophetess, who had appeared in the town of Bolton-on-the-Moors, in Lancashire—a poor woman, Jane Wardlaw, wife of a tailor, who was a representative of the fanatical French Camisards (q.v.), some of whom had found refuge in England: this woman believed that she had 'received a call' to go forth and testify for the truth. The burden of Jane Wardlaw's message was, that the end of all things was at hand, that Christ was coming to reign upon the earth, and that his second appearance would be in the form of a woman, as prefigured in Psalm xlv. In subordination to this, she took up several of the tenets of the Society of Friends, to which she and her husband originally belonged; especially, she raised her voice against war and against all taking of oaths. Her followers believed that she was filled with the Holy Spirit

they received her utterances as the voice of God, and she acted as if all the powers of earth and heaven had been given into her hands. Ann Lee, on her conversion, began to preach the same message in Toad Lane and the adjacent streets of Manchester; but she soon went beyond her teacher, and gained the leadership of her co-believers for herself. It happened that she was brought before a magistrate, charged with an obstruction of the streets, caused by the crowd collected to hear her preach, and she was sent to the Old Bailey Prison in Manchester. When she came out of prison, she gave forth that one night a light had shown upon her in her cell; that the Lord Jesus stood before her; and that He became one with her in form and spirit. Her pretension was that Christ was come to reign in her person. It was favorably entertained by the followers of Jane Wardlaw; and they acknowledged her as their Head, or Mother, in place of Jane, whose pretensions had never risen to such a height. Ann found, however, that among her neighbors and fellow-workers, her claim to be the Bride of the Lamb, the Queen described by David in the Psalms, excited only ridicule; and she received a revelation that in America the foundations of Christ's kingdom were to be laid. So she went to New York, accompanied by seven disciples—five men and two women. Her husband also went with her; but he seems to have had no faith in her, and he left her soon after their arrival, in consequence of one of the features then introduced into her system. This was the practice of celibacy, which she had not previously enforced on her followers, though she had enjoined it as a duty. Her teaching was, that men called into grace must live as the angels do, among whom there is no marrying or giving in marriage; that no form of earthly love could be allowed in the Redeemer's kingdom. Finding a populous city unfavorable to her designs, she removed, with her followers, first to Albany, then far into the wilderness to Niskenna, and there founded the settlement which still exists, of Watervliet. It was in the spring of 1780—when she had been three years and a half at Niskenna, looking for new believers to come in, but making no attempt to win them—that the first American converts joined her Society. A religious revival at Albany had spread through the surrounding districts; and from Hancock and New Lebanon a deputation was sent to Niskenna, to see what light its inhabitants enjoyed as to the way of salvation. The deputation consisted of Joseph Meacham and Lucy Wright—subsequently the heads of the Shaker Society. These persons became believers in Ann Lee; through their agency, other converts were won, and a Shaker Society was established in the town of New Lebanon, which forms the post-village now known as Mt. Lebanon, in Columbia co. N. Y., on the border of Mass. Toward the close of 1780, the revolutionary war being in progress, notoriety was given to Ann Lee's pretensions, through an incident seemingly unfavorable. Owing to her British origin, her denunciations against war, and her refusal to take the colonial oaths, Ann was imprisoned at Pough

keepsie, on suspicion of being a British spy. Before she was let out of prison, 1780, Dec., all the colonies had heard of 'the female Christ.' In the following year, she started on a missionary tour through New England and adjacent colonies; she found the people everywhere curious to see her, and she made not a few converts. She did not return to Watervliet till 1783, Sep.; and about a year afterward she died. Her death was a surprise to many of her followers, who believed that she was to live among them forever; but her successors—Joseph Meacham and Lucy Wright above mentioned—to whom, on her death-bed, she had made over the headship of the Society, were ready with a theory accounting for it: 'Mother Ann,' they said, could not die, and was not dead, and had not ceased to live among her people. She had only withdrawn from the common sight; she was still visible to eyes exalted by the gift of grace; she had cast the dress of flesh, and was now clothed with a glory which concealed her from the world. So it would be with every one of the saints in turn; but the spirits of those who 'passed out of sight' would remain near and be in union with the visible body of believers. This explanation was generally accepted, and this spiritist tenet has become a vital part of the Shaker creed.

By Joseph Meacham and Lucy Wright, the successors of 'Mother Ann,' the Shakers were gathered into settlements, ten in number; and a covenant was drawn up embracing the chief points of their creed, and of the social system since associated with it. Their head was, of course, 'Mother Ann'—that is, Christ—of whom Joseph and Lucy were temporarily the representatives; elders and deacons, male and female, were appointed; the institution of celibacy was confirmed; and a community of goods was introduced. On the death of Joseph Meacham 1796, 'Mother Lucy' became sole head of the Society, and she governed it with ample powers for 25 years. She named a female successor with the title Elderess; and the name of 'Mother' has not, since that time, been applied to the female head of the community. Eleven societies were formed 1787-92. Early in the 19th century the Shakers, taking advantage of a remarkable religious excitement in Ky., sent three representatives thither, and received sufficient additions to found five new societies. (See Nordhoff's *Communistic Societies of the United States*, 1875). The Shakers were, at the census of 1870, about 2,500 in number, included in 18 societies; three in N. Y., four in Mass., two in N. H., two in Maine, one in Conn., four in O., and two in Ky. They now number 15 churches and 1,000 members.

Their doctrine has been to some extent developed as well as systematized since the death of 'Mother Ann.' They believe that the kingdom of heaven has come; that Christ has come upon earth a second time, in the form of 'Mother Ann,' and that the personal rule of God has been restored.

Then they hold that the old law has been abolished, and a new dispensation begun; that Adam's sin has been atoned, that man has been made free of all errors except his own; that the curse has been taken away from labor; that the earth and all that is on it will be redeemed Believers, on going 'into union,' i.e., entering the society of S., die to the world, and enter on a new life—not a mere change of life but a new order of being. For them, there is neither death nor marriage; what seems death is only a change of form, a transfiguration which does not hide them from the purified eyes of the saints; and in 'union,' as in heaven, there is no marrying or giving in marriage—the believer owes love to all the saints, but his love must be celibate in spirit and in fact. The believer, living in union, *is* in heaven: the S. believe that the earth, now freed from the curse of Adam, is heaven; they look for no resurrection besides that involved in living with them in 'resurrection order.' The believer, entering into union, leaves behind all his earthly relationships and interests, just as if he had been severed from them by death. And since to be in union is heaven, the S. hold that no attempts should be made by them to draw men into union: God, they say, will draw to them at his own time those whom he has chosen. Those who have 'passed out of sight' are still in union; and the S. live in daily communion with the spirits of the departed believers. This belief in a communion with angels and spirits, is no mere theory; it has most important influence on their lives: they profess to be more familiar with the dead than with the living. As it is the work of the saints to redeem the earth from the effects of the curse, labor is a sacred and priestly function, especially when bestowed in making the earth yield her increase, and in developing her beauty. It should be done in a spirit of love; the earth, they say, yields most to those who love it: and love and labor will in time restore it to its primitive state. According to Hepworth Dixon, they bestow on their gardens and fields the affections which other men bestow on family or worldly goods. Their country they regard only as it is a part of the earth which they love, and as the favored land in which God's kingdom is first to be established. In its politics and its national fortunes, they take no interest; indeed, their whole system is a protest against the existing constitution of society, as well as against the ordinary lives of men. They look for a reconstruction of the whole social and governmental order; but this is to be reached only by the operation of moral principles: physical force they utterly abhor. Consistently with their belief in the second appearance of Christ in the form of a woman, the S. seem to believe that there is a female as well as a male essence in the Godhead—in the motherhood as well as the fatherhood of God.

A Shaker settlement is, for convenience, divided into families, consisting of the brothers and sisters, who live in the same houses, each governed by an elder and an elderess. There are two orders of members. Probationers and Covenanters—that is, novices and full members. It is on becom-

ing a covenanter that the Shaker puts his property into the common stock. Entering on residence, he becomes subject to all the rules of the Society; but he is free—whether a covenanter or a probationer—to leave the body whenever he pleases. Both men and women wear a prescribed dress. The men wear a sort of Arab sack, with a linen collar and no tie; an under-vest buttoned to the throat, and falling below the thighs; loose trousers, rather short; and a broad-brimmed hat, usually straw. The women wear a small muslin cap, a white kerchief round the chest and shoulders, a skirt dropping in a straight line from the waist to the ankle, white socks, and shoes. Some latitude is allowed as to the materials of the dress. Men and women, according to Dixon's impression, have the look of persons 'at peace with earth and heaven.' 'Apart from a costume neither rich in color nor comely in make, the sisters have an air of sweetness and repose, which falls upon the spirit like music shaken out from our village bells.' [*New America*, by W. Hepworth Dixon (Lond. 1867), from which the materials of this sketch have largely been derived.] All labor with their hands, both men and women; but the women do only indoor work. Every man, whatever his rank in the church, follows some manual occupation, and most of them have more than one occupation. Working not for gain, but with loving care, and with the sense that they are exercising a priestly function, the S. are unrivalled among their neighbors in the arts to which they apply themselves, especially the culture of their land, and the production of fruits and flowers. Several important agricultural and mechanical inventions are due to them. They pay great attention to ventilation and to all sanitary conditions; they live almost entirely on the produce of the soil, and drink only water; they employ no doctors, and take no drugs, and are, nevertheless, among the most healthful of communities. Their Society is recruited mostly by young men and girls; but occasionally, married persons with their children come 'into union,' and make, it is said, 'very pretty Shakers.' Husbands and wives, when they have come 'into union,' become as brothers and sisters. The education of the children attached to the Society is the work of the sisters, and they do it exceedingly well. The brothers and sisters take their meals in a common room, eating at six in the morning, at noon, and at six in the afternoon. Their meals are taken in silence, any direction that has to be given being given by a gesture or in a whisper. In their church-service, music is prominent; the hymns and chants all being of Shaker origin, communicated to believers in dreams and reveries by the spirits with whom they have communion. A deputation of Shakers visited England 1871, and again 1877; and were welcomed with many attentions by the spiritists and the vegetarians, who entertained them at their homes and gathered large audiences to hear their earnest addresses; though not many converts seem to have been gained to Shakerism as a distinguishing tenet.

SHAKESPEARE WILLIAM, poet and dramatist; b. Stratford-on-Avon, in Warwickshire, 1564, Apr.; d. 1616, Apr. 23. The date of his birth is unknown, but as he was baptized Apr. 26, and it was a common practice to baptize babies when three days old, it has been supposed that he was born Apr. 23.

His father, John S., was of the yeoman class and in early life a farmer in a village near Stratford, to which town he came, about 1553, and adopted the trade of a 'glover,' dealing also in wool and farm produce. He was successful in business, soon buying two houses in Stratford; and also becoming popular with his townsmen, rapidly rising through the lower grades of public office until in 1568 he was chosen high bailiff or mayor. He married Mary Arden, who belonged to a branch of an old and famous Warwickshire family, and inherited a considerable estate from her father. The couple had four sons and four daughters, William being the third child but the eldest son.

At the age of seven—the earliest at which children were admitted—he probably entered the Stratford Grammar School, an ancient institution of the same grade as Eton and Rugby, well endowed and taught by masters of good scholarship and reputation. There he learned Latin and possibly a little Greek, with writing and arithmetic, but not much else. It is quite certain that this was all the regular schooling he ever received. His works, from which a few critics have hastily concluded that he was familiar with ancient and modern languages, furnish abundant and indisputable evidence to the contrary. His quotations from Latin are such as a schoolboy might make from Virgil, Ovid, and the other authors then studied in the grammar schools; and in more than one instance they are taken, not from the authors themselves, but from the abridged passages given in the Latin Grammar that was then in general use as a text-book. In his plays he drew his historical material from a small number of English authorities, like Holinshed's *Chronicles* and North's *Plutarch*, which was an English version of a French translation of the original Greek; and in using these he blindly copied errors, misprints, and corruptions which a classical scholar (like Bacon, for instance) could never have made.

The notion that S. was a scholar is a mistake of comparatively recent date. We find nothing of the kind in the references to him during his life and for at least a century later. These, without a single exception, emphasize the fact that he did his work 'without Latin helps,' that 'his learning was very little,' that 'nature itself was all the *art* which was used on him,' that 'he needed not the spectacles of books to read Nature, but looked inwards and found her there'—to quote a few out of many expressions to the same effect. His ignorance is often contrasted with Ben Jonson's erudition; as by Dryden, who

says that he lacked 'the learning and care which Jonson had;' and again, in verse,

> Great Jonson did that ignorance adore,
> And tho' he envied much, admired him more.

Such was the universal opinion of the best critics of the 17th. c.; but about the middle of the 18th c. a few commentators thought they found in the plays certain passages that indicated a knowledge of Greek, Latin, and other foreign works which had not been translated into English in the time of S. This view was refuted by Richard Farmer in his *Essay on the Learning of Shakespeare* (1766), so completely that Dr. Warton declared that it 'put an end forever to the dispute.' It has, however, been revived in our day by the heretics who believe that Bacon wrote the works of S., but they have never converted a single Shakespearian scholar worthy of the name.

Though all the regular schooling, properly so called, that S. had was got in the Stratford school between the ages of 7 and 13, or possibly a year or two later, this was but a small part of his *education* in the broader sense. The training he had at school was of course valuable to him in many ways; but the greater part of his training for the work he had to do in the world was obtained in bigger and better schools than the one where be acquired the 'small Latin and less Greek,' with which Ben Jonson credited him. Warwickshire, with its beautiful scenery, its historical, legendary, and dramatic associations, with its rural population and industries, was an excellent school for the boy, and had much to do in developing his love and knowledge of nature, history, romance, and poetry, as well as of rural life and character. He could not have been more fortunate in his birthplace and early home if he had been able to choose it himself.

London, his only other home, was a liberal education for the young man, better and broader than Oxford or Cambridge could have been—better, indeed, in some respects than it would be to a young actor and dramatist now-a-days.

The mighty metropolis of the present time, with almost 20 times the population of that period, cannot gather so brilliant a company of poets and dramatists as used to meet at the Mermaid in Bread street, to say nothing of the many other men of letters who thronged 'the spacious times of great Elizabeth.' And London was the centre of the literary activity and brilliancy of that marvellous age. We can hardly conceive what stimulus, what inspiration S. must have found in its life and society. He might have said, with Beaumont in his rhymed letter to Ben Jonson:

> What things have we seen
> Done at the Mermaid! Heard words that have been
> So nimble and so full of subtle flame
> As if that every one from whence they came
> Had meant to put his whole life in a jest,
> And had resolved to live a fool the rest
> Of his dull life.

And this was but the diversion, the recreation, of his daily life. The player and the dramatist then associated, not only with the wits of his own circle, and the congenial spirits who met with them at the Mermaid and the Falcon, but with noblemen and courtiers, and even with royalty itself. Elizabeth never visited the public theatres, but she often had the plays of S. performed before her at court; and the tradition that he wrote *The Merry Wives of Windsor* at her command is not improbable.

London was not only a liberal education for the dramatist, but eminently the place for him to reap and enjoy the fruits of that education.

The few editors and critics who have imagined that they found indications of scholarly learning in the plays have been led into the error, partly on what might seem at first to be the general evidence, particularly in the Greek, Latin, and English historical plays, of a deeper insight into political movements and tendencies in former times, and into the character of the persons concerned in them, than would appear to be possible in one who was not a thorough scholar; and partly because of the passages and expressions mentioned above which have been supposed to be taken directly from classical authors and not from translations. The solution of the first problem, or difficulty, is expressed in the single word *genius*, which, as all the early critics of S. and the great majority of more recent ones have rightly assumed, is superior to mere *learning*, and in a way independent of it. Ben Jonson wrote Roman plays which, in minute attention to the manners and customs of the time, are far more scholarly and accurate than those of S. They evince genuine poetic power as well as laborious research, and yet the dramatic effect is far inferior to that of its less pedantic treatment of Roman subjects.

He knew much less than Ben did of classical history and antiquities, but had a keener insight into human nature, which is the same in all lands and all ages. Jonson has given us skillfully modelled and admirably sculptured statues, but S. gives us living men and women. And people who have neither genius nor learning can feel the difference though they may not understand it. As Leonard Digges tells us, the audiences of Elizabethan days crowded the theatres when *Julius Cæsar* was played, and were 'ravished' by it,

> When they would not brook a line
> Of tedious (though well laboured)—*Catiline*.

Jonson's *Catiline* was 'well laboured' [skillfully elaborated] but 'tedious;' but S. 'held the mirror up to Nature,' and even common folks could see and enjoy it.

As to the apparent similarity of passages in S. and in classical literature, we know that some translations of ancient works had then been made and printed that are not now extant, and that others were circulated in manuscript, but never printed, which S. may have seen. We know also what an extensive acquaintance he had with

scholars like Jonson and many others of his fellow dramatists. At the Mermaid and the Falcon, moreover, the conversation must often have been enlivened by striking quotations from Greek and Latin literature, dramatic and other; and we may be sure that what S. heard there worth remembering he absorbed, assimilated, and never lost or forgot. Most of the alleged resemblances cited in support of the classical knowledge of S., however, are neither plagiarisms nor reminiscences on his part, but mere co-incidences of thought and expression, like countless instances of the kind in other authors. This has been absolutely demonstrated so often in literary history that it is the probable and sufficient explanation of these imaginary debts of S. to his predecessors.

That the boy was taken out of school at the age of 13 is likely from the fact that his father's fortunes were then declining, apparently on account of the general depression in trade at that time rather than from any lack of business ability on his part. He may have needed his son's help in his own work or have felt obliged to find other employment for him. One tradition says that William was bound apprentice to a butcher, but later ran away to London; another makes him an attorney's clerk for a time. The knowledge of law shown in his works has led Lord Campbell and other legal critics to believe this latter story; but Judge Allen of the Massachusetts Supreme Court (*Notes on the Bacon-Shakespeare Question*, 1900) has found evidences of equal familiarity with legal technicalities in the works of other Elizabethan dramatists, and has detected many mistakes in these matters that S. has made of which no lawyer or student of law could be guilty.

The next fact in the history of the youth that is positively known to us is that he was married, when between 18 and 19, to Ann Hathaway who was about eight years older. She was the daughter of Richard Hathaway, a well-to-do farmer in the neighboring village of Shottery, where the cottage in which he is supposed to have lived was bought in 1892 (as the birthplace of S. in Stratford had been bought in 1848) as a national memorial of the poet's history. No record of the marriage has been preserved, but it probably occurred early in December, 1582, a bond authorizing it 'with once asking of the bans' being still extant in the Episcopal registers at Worcester, the diocese in which Stratford and Shottery are situated. A daughter of the couple was baptized with the name Susannah, at Stratford, 1583, May 26. Twin children, Hamnet and Judith, were baptized 1585, Feb. 2, two months before S. was twenty-one.

The marriage was apparently favored, as was natural, by the parents of the bride, but not by those of the bridegroom, though we have no reason to suppose that he himself was disinclined to it. It is not improbable, as some biographers believe, that William and Ann had been formally betrothed several months before the marriage,

according to a familiar practice of the day, particularly among the common people. This betrothal was a legal ceremony often performed before a priest, and violation of the contract was punished by the ecclesiastical law with excommunication. Neither of the parties could legally marry another person, except by their joint consent; and the betrothal was often regarded as conferring the rights and privileges of the more formal union that was expected to follow. It is to be noted that S. was well acquainted with this ancient betrothal, and has introduced it in at least seven of his plays. In *Twelfth Night* Olivia, who has been berothed to Sebastian, addresses him as 'husband,' and justifies herself by an appeal to the priest, before whom the ceremony had been performed with the understanding that it was to be kept secret until the marriage should be solemnized. Robert Arden, the poet's maternal grandfather, in a legal document, calls his daughter Agnes the 'wife' of the man to whom she was betrothed, but whom she did not marry until three months afterward.

Two or three years after his marriage (in 1585 or 1586) S. left his family in Stratford and went to London to seek his fortune. What employment he found there at first we do not know. The tradition that he began by holding horses at the door of the theatre may or may not be founded on fact; and the same may be said of the story that he first got work inside as 'call-boy' or prompter's assistant.

We learn nothing definite about him until about seven years later (1592), when a contemptuous allusion to him in a little book by Robert Greene, printed after his death, indirectly proves that S. was then an actor and had also begun his career as an author by revising old plays for a fresh lease of life on the stage. This is confirmed by a criticism on Greene's book by Henry Chettle (published in Dec., 1592) in which he refers to S. as 'exelent in the qualitie [of actor] he professes,' and as commended by 'divers of worship' [people or rank] for 'his uprightness of dealing' and for 'his facetious [felicitous] grace in writing.' It is clear that he was then making his mark in his double profession, and gaining friends and patrons of rank and influence.

Only a few facts in his personal history for the next seven or eight years have come down to us. In 1596 his son Hamnet died and was buried at Stratford. Early in 1597 he bought New Place, a fine old mansion in the best part of Stratford, and afterwards made other landed investments in the town and its vicinity. He also assisted his father in repairing his fortunes, and in an attempt to regain an estate belonging to his mother which had been forfeited as the result of a mortgage. In 1594 we find that he was one of the players in two comedies acted before Queen Elizabeth at Greenwich Palace. He was concerned in other performances at Court in 1596 during the Christmas holidays; Twelfth Night and Shrove Tues-

day, 1600, and Dec. 26, of the same year; four times in the Christmas holidays of 1601; and in Feb., 1603—little more than a month before the death of Elizabeth on Mar. 24, 1603. In May, 1603, very soon after he came to the throne, King James granted a license to S. and his company to play in London and the provinces. They performed at Court afterward, as the records show.

We know little about the parts that S. himself played. One, it is said, was Adam in *As You Like It*, and another the Ghost in *Hamlet*. He appeared in Ben Jonson's *Every Man in His Humour* in 1598, and John Davies says that he 'played some kingly parts in sport;' but it is certain that he never gained high rank as an actor. His annual income from revising and writing plays and all other sources up to 1599 probably did not exceed £135, equal to seven to ten times as much in modern money. Later, with his shares in the Globe Theatre, etc., his total income must have been at least £500 a year.

As early as 1611, S. returned to Stratford and settled down at New Place. In that year and afterward his name occasionally appears in the local records as a resident in the town. In June, 1607, his daughter Susannah was married to Dr. John Hall, a physician of large practice in Stratford and vicinity; and in Feb. 1616, the younger daughter Judith became the wife of Thomas Quiney, a vintner, who afterward held sundry offices in the Stratford government. At the time of Judith's marriage her father's health was failing, and in April he died, his burial being recorded in the parish register on the 25th of the month. The rough draft of his will, made in Jan. 1616, was hastily finished and signed during his last illness, without waiting for a clean transcript of it. The only mention of his wife in the document is an interlined bequest of the 'second-best bed with the furniture.' This has been assumed by some biographers to indicate that he was unhappy in his conjugal relations. It is absolutely the sole ground for this view, while there is abundant and conclusive evidences to the contrary. For more than 20 years before leaving London we have seen that he was planing for his return to Stratford, buying the best house in the town and gradually making the estate an ideal home for his declining years. That he expected to share that home with a wife from whom he was estranged is impossible. The gift of the bed, like many similar bequests in wills of the time, was obviously prompted by love and tender memories, not the insult of a dying man to the mother of his children. His wife was amply provided for by her rights of dower, and the omission of further reference to her in the document was in no respect exceptional. She survived her husband almost seven years—until 1623, Feb.—and, according to tradition, she earnestly desired to be laid in the same grave with him.

The chronology of the poet's literary career has been the subject of much controversy but is now approxi-

mately settled. His earliest published works were the poems, *Venus and Adonis* (1593) and *Lucrece* (1594); but Greene's fling at him in 1592 proves that he had then begun to gain reputation in dramatic composition, if only in revising old plays for reproduction on the stage. *Titus Andronicus* (earliest extant edition 1594) may have been the first of these; followed by the three parts of *Henry VI.* His first entirely original work was probably *Love's Labour's Lost*, written as early as 1591, and 'newly revised and augumented' before 1598, when the oldest extant edition was printed. *The Two Gentlemen of Verona* and *The Comedy of Errors* soon followed, with the first version of *Romeo and Juliet*, afterward revised and enlarged. *Richard III.* belongs to the same period, and *A Midsummer Night's Dream*, generally ascribed to 1594. Between 1595 and 1600 the series of English historical plays (except *Henry VIII.*) was completed; also *The Merry Wives of Windsor*, *The Taming of the Shrew* (based on an anonymous play with similar title, printed in 1594), *The Merchant of Venice*, *As You Like It*, *Much Ado About Nothing*, *Twelfth Night*, and *Julius Cæsar*.

These plays were followed by *All's Well That Ends Well*, *Measure for Measure*, and *Troilus and Cressida*, the dates of all three being more or less uncertain, though they form a natural group, marking the transition from the 'golden prime of comedy' to the period of the great tragedies, *Hamlet* (1603, enlarged in 1604), *Othello* (1604), *Macbeth* and *Lear* (1606 or 1607), *Antony and Cleopatra* and *Coriolanus* were probably written in 1607 or 1608. Then followed the last group of plays, which have been aptly called the 'Romances'—*Cymbeline*, *The Winter's Tale*, and *The Tempest*,—written probably in that order.

In addition to the plays of mixed authorship connected with the early years of the poet's literary career, several others of later date apparently have a similar history—*Timon of Athens*, *Pericles* and *Henry VIII.* Some critics believe that in all of these S. wrote in collaboration with other authors; but the more plausible theory is that, after being begun by him, they were laid aside or left unfinished and were later completed by others. Who finished *Timon* we do not know, but in the case of *Pericles* it was quite certainly George Wilkens, who in 1608 published a novel avowedly based upon it. Fully half of *Henry VIII.* is evidently by John Fletcher; the rest is clearly by S. though some critics have ascribed it to Massinger. *The Two Noble Kinsmen*, which the title page asserts to be by 'Mr. John Fletcher and Mr. William Shakespeare,' has been included in several modern editions of S.; but it is improbable that he wrote any part of it, though Fletcher's share is indisputable.

The *Sonnets* of S. were first published in 1609, but Francis Meres, in 1598, refers to his 'sugred sonnets among his private friends' and two of them were printed in 1599. Most of them were probably written between 1597 and

SHAKESPEARE.

1601, but some may be of later date. *A Lover's Complaint*, printed with the *Sonnets* in 1609, is certainly by S., and so is *The Phenix and the Turtle*, which was printed in 1601. The other short poems in modern editions are probably not his.

The only works of S. published by his authority and under his own supervision were the *Venus and Adonis* and *Lucrece*, both of which were dedicated to the Earl of Southampton. The *Sonnets* and 16 of the plays were printed by piratical publishers before the first collected edition of the plays (except *Pericles*) was brought out in 1623 by two of his friends and fellows-actors, John Heming and Henry Condell. This edition is known as the 'first folio' or 'folio of 1623.' Though it had no editing worthy of the name, and is marred by many thousands of misprints and corruptions, it is the only early authority for 20 of the plays.

It was reprinted in 1632 (the 'second folio'), with little or no improvement. A 'third folio' appeared in 1663, reprinted in 1664 with the edition of *Pericles* and seven plays falsely attributed to S. The 'fourth folio' (1685) was a reprint of the third with no material change except in spelling. No other collected edition was published before Rowe's (1709), which was based on the 'fourth folio.' Other complete editions in the 18th c., and early 19th c. were Pope's (1723–5), Theobald's (1773), Hanmar's (1744), Warburton's (1747), Johnson's (1765), Capell's (1768), Steevens's revision of Johnson (1773), Malone's (1790), Steevens's (1791–1802), Reed's (1803), Chalmer's (1805), and the *Variorum* of 1821, edited by James Boswell. Since 1821, editions, commentaries, and other critical books on the life and works of S. have been too numerous for mention here.

For the bibliography of the subject see Lowndes's *Library Manual* (Bohn's Edition), and the *Shakespeariana* (3,680 titles) of the *British Museum Catalogue* (published separately in 1897).

SHAKESPEAREAN, a. *shāks-pē′rĭ-ăn:* of or pertaining to Shakespeare or his works, or in his tyle.

SHAKO, n. *shăk′ō*, SHAK′OES, n. plu. *-ōz:* see CHACO.

SHALE, n. *shāl* [Ger. *schale*, a shell; *schälen*, to peel or shell off]: a shell or husk. In *geology*, shale or slate-clay is an indurated clay, which often forms beds in the geological series. It is composed chiefly of silica and alumina in variable proportions, but also frequently contains considerable carbonate of lime and oxide of iron. It is of gray or grayish-black color, or brownish when containing much iron, as hydrated peroxide, and red when the peroxide is anhydrous; sometimes the color is olive. Its structure is more or less slaty. It is soft, and easily reduced to powder. When free from lime and iron, it is reduced to powder, and used for making fire-bricks, for which it affords excellent material. S. very often contains a notable quantity of bitumen, and when this is so much the case that the mineral crackles and blazes in the

fire, emitting a black smoke and a bituminous odor, it is known as *Bituminous Shale*. This variety sometimes passes on the one hand into common S., and on the other into coal. Impressions of ferns and other plants are very frequently found in shale of the coal period.

Slate, Schist, and Shale are names employed to denote those kinds of rock which are laminated or fissile—that is, which possess a structure readily splitting into thin layers. *Schist* is a term properly applied only to crystalline rocks—namely, such as have an imperfect fissile character, such as hornblende and other schistose rocks. *Slate* is a name applied to those that are readily and evenly separable into thin layers. True slate differs from schist and shale in not having its lamination produced by bedding: see SLATE.

S. varies much in composition. Clay, sand, lime, bitumen, and other bodies, either singly or any mixture of them, are included under the name if they form rocks which split into layers in the direction of their bedding· clay, however, being an ingredient in most shales. Strange as it may seem, the line between even coal and some kinds of S. is not well defined; and in the case of the Torbane-hill mineral, found near Bathgate, England, the question by which of the two names it should be called led to a lengthened and costly litigation.

The importance of certain decomposing shales through which sulphuret of iron is dispersed, for the manufacture of alum, has been long known, and a large quantity is raised for that purpose from the carboniferous beds of England, France, Germany, and N. America. The unconsolidated Tertiary clay of Gayhead, Martha's Vineyard, is much used for the alum industry.

Bituminous shales—that is, shales more or less rich in carbon and hydrogen—form a class of these bodies which have, in recent years, attracted much notice as sources of oil for illuminating purposes. But neither in France nor in England did the first attempts at profitable manufacture succeed. On account of these failures, the process fell into abeyance, until it was revived by the success of the well-known patent of James Young (see PARAFFIN OIL), 1850, for production of paraffin and paraffin-oil from coal. Except for the solid paraffin, which Young was the first to obtain on the large scale, and the employment of coal instead of shale, the processes of Du Buisson and Young are essentially the same. This process has created an important branch of industry, paraffin-oil and paraffin being economically obtained by it from either coal or shale of certain kinds. Many of the shales were found on trial to yield 30 to 50 gallons of crude oil per ton; and works—several of great size—were accordingly started in many places over the entire area of the coal formation in Scotland, also at various localities in England, for manufacture of mineral-oil, paraffin, etc., from this material. The enormous development of the mineral-oil industry in the United States, and to a considerable extent elsewhere, has not destroyed the British manufacture from shales; it has only led to ingenious devices for extracting every element of

value and using all combustible waste for fuel. Owing partly to the comparative cheapness of shale, partly also to the fact that these products are obtained from it in a state more easily purified than when they are got from coal, the use of coal as a source of them is now almost given up. In Scotland, where chiefly the manufacture of paraffin-oil is carried on, the shales used are called 'oil shales,' and it is estimated that 1,300,000 tons of this material yield the following products:

Crude oil	32,000,000 gallons
Paraffin	400,000 gallons
Lubricating oil	25,000 tons
Paraffin scale	15,300 tons
Sulphate of ammonia	10,500 tons

In addition to these are illuminating gas, gasoline, naptha, etc.

SHALER, *shā'lėr*, ALEXANDER: soldier: b. Haddam, Conn., 1827, Mar. 19. He entered the army 1845, and held the rank of major at breaking out of the civil war; became lieutenant-colonel U. S. chasseurs 1861; promoted colonel 1862; brigadier-general U. S. volunteers 1863. He took part in the battles of Fair Oaks, Malvern Hill, Fredericksburg, Marye's Heights, and Gettysburg; was taken prisoner in the battle of the Wilderness, and after exchange served in the southwest. He was brevetted maj.gen. 1865; was maj.gen. of the 1st division of the national guard 1867-86; reorganized the Chicago fire department after the great fire; was commissioner of the fire department of New York 1870-73; and president of the New York board of health 1883-87.

SHALER, *shā'lėr*, NATHANIEL SOUTHGATE: American geologist: b. Newport, Ky., 1841, Feb. 20; d. Cambridge, Mass., 1906, Apr. 10. He was graduated from the Lawrence Scientific School, Harvard, in 1862, served in the Union army as an artillery officer, and then returned to the Lawrence School, where he was assistant and instructor in geology and zoology. He accepted the chair of palæontology at Harvard in 1868, was transferred in 1887 to that of geology, which he occupied till his death, and he was dean of the Lawrence School from 1891. In 1873-80 he was in charge of the Kentucky geological survey, and from 1884 was director of the Atlantic division of the United States geological survey. He was commissioner of agriculture for the State of Massachusetts at different times, was president of the Geological Society of America in 1895, and besides numerous reports for the United States geological survey published *Kentucky Geological Reports and Memoirs* (7 vols. 1876-82); *The Story of Our Continent* (1892); *The Interpretation of Nature* (1893); *The United States of America* (2 vols. 1894); *The Individual: Study of Life and Death* (1900); *The Citizen: A Study of the Individual and the Government* (1904); etc.

SHALL, v. *shăl* [the true origin seems to be Norw. *skil*, separation, difference: Icel. *skil;* Norw. *skiel*, right: Sw. *skal*, reason, ground, motive: Icel. *skal;* AS. *sceal*, I shall—fundamentally signifying, I have ground for, I have reason]: an auxiliary and defective verb; one of the two signs employed to express futurity, *will* being the other; in the first person *shall* simply foretells or declares; in the second person (shalt) and third person (shall) it promises or expresses determination; interrogatively, *shall* either asks for permission or for direction; *shall* like *will*, apart from its other senses, uniformly denotes futurity. SHOULD, pt. *shûd*, as an auxiliary, expresses a conditional present, a contingent future, an obligation or duty.

SHALLI, n. *shăl'lĭ:* a twilled cloth made from hair of the Angora goat; name now applied to a fabric resembling muslin-de-laine, without twill.

SHALLON, n. *shăl'on*, or SALAL, n. *săl'al* [etym. doubtful]: *Gaultheria Shallon*, small, shrubby, evergreen heathwort, with white flowers, growing in pine forests in N. America. The berries are used for tarts, and the Indians make them into bread.

SHALLOON, n. *shăl-lôn'* [from *Chalons* or *Chalons-sur-Marne*, in France]: light worsted cloth, said to have been made first at Chalons, in France.

SHALLOP, n. *shăl'lŏp* [F. *chaloupe;* It. *scialuppa;* Sp. and Port. *chalupa;* Dut. *sloep*, a sloop]: small light boat. Also, a large, open, old-fashioned boat, carrying two masts, rigged as in a schooner. Its principal use was in the fisheries.

SHALLOT, n. *shăl-lŏt'* [F. *échalote;* OF. *eschalote, escalogne*—from L. *ascalōnĭă*, a shallot—so called from *Ascalon*, a city of Palestine: It. *scalogno*], (*Allium Ascalonicum*): plant, native of Palestine, whence it was brought to Europe by the Crusaders. It is grown for its bulbs, which somewhat resemble those of the onion. Its leaves also are used to some extent. It is hardy and can be brought to market several weeks earlier than the onion. It is grown from the bulbs, which are divided, and, in the latitude of New York, planted in September or October in rows 12 in. apart, and 6 in. apart in the row. The main difference in the so-called varieties is the size which they attain. This is determined mainly by the character of the soil and the care in cultivation.

SHALLOW, a. *shăl'lō* [Swiss, *schalb*, slanting: Icel. *skiálgr*, oblique: Scot. *schald*, shallow]: having little depth; not far to the bottom; superficial; trifling; empty; silly: N. any place where the water has but little depth; a flat; a shoal: V. to make shallow. SHAL'LOWING, imp. SHAL'LOWED, pp. *-lōd*. SHAL'LOWLY, ad. *-lĭ*, with no great depth; simply; foolishly. SHAL'LOWNESS, n. *-nĕs*, the state of being shallow; want of depth; want of understanding; emptiness; silliness. SHALLOW-BRAINED, a. silly; empty-headed.

SHALT, *shălt:* second pers. sing. of SHALL, which see.

SHAM, n. *shăm* [probably the same word as SHAME, which see: comp. Ger. *schemen*, a shadow, phantom: Gael. *seamasan*, an evasion, a sham]: something that deceives expectation; a pretense; an imposture: ADJ. false; pretended: V. to pretend in order to deceive; to counterfeit; to make false pretenses. SHAM'MING, imp. SHAMMED, pp. *shămd.* SHAM'MER, n. *-mĕr*, one who shams. To SHAM ABRAHAM, in *slang*, to pretend to be ill.

SHAMAN, n. *shăm'ăn* [Pers. *shaman*, an idolater]: priest or conjurer among the Ostiaks and some other tribes in Asiatic Russia, who believe in the existence of a Supreme Being, but assign the immediate government of the world to secondary gods, some of whom are benevolent and others malevolent, and by whose aid the *Shamans* pretend to cure diseases, foretell events, etc. SHAM'ANISM, n. *-ĭzm*, the idolatrous worship and practices of the Ostiaks and other inhabitants of Siberia; the ancient religion of the Tartar and some other Asiatic tribes. It is a belief in sorcery, and a propitiation of evil demons by sacrifices and frantic gestures. The following account of it is from the *Asiatic Journal.* The priests are men or women, married or single. The character is acquired by pretending that the soul of a deceased priest has appeared to the individual in a dream, appointing him or her his successor. If the priests are in function, they wear a long robe of elk-skin, hung with small and large brass and iron bells; moreover, they carry staves carved at the top into the shape of horses' heads, also hung with bells; and with the assistance of these staves, they leap to an extraordinary height. The followers of the Shaman religion have neither altars nor idols, but perform their sacrifices in a hut raised on an open space in a forest or on a hill. Nor are there fixed periods for the performance of their ceremonies; births, marriages, and sickness, uncommon appearances in the atmosphere, or public calamities, are generally the occasions which call for them. The animal to be sacrificed is usually fixed upon by the Shaman or the donor; and after the persons uniting in the ceremony have assembled, the Shaman enters the hut, chanting certain words, sprinkles on all the sides of the hut, and over the fire, spirits and milk, and then orders the animal to be killed, which is done by its heart being torn out. The skin of the victim is then stripped off, and its flesh, except a few pieces thrown into the fire, is consumed by the persons assembled. See also LAMA. SHAM'ANIST, n. *-ĭst*, believer in Shamanism.

SHAMBLE, v. *shăm'bl* [O Dut. *schampelen*, to shamble: Swiss, *tschümpelen*, to go about in a slack and trailing manner: a form of *scamble*, to scramble]: to walk awkwardly and unsteadily, as if the knees were weak. SHAM'BLING, imp *-blĭng:* ADJ. moving awkwardly and irregularly: N. an awkward, clumsy, irregular gait. SHAM'BLED, pp. *-bld.*

SHAMBLES, n. plu. *shăm'blz* [L. *scamil'lus, scamellum,* dim. of *scamnum,* a bench or stool: OF. *eschamel,* a stool: AS. *scamel,* a stool—*lit.,* the benches on which meat is exposed for sale]: a slaughter-house; a flesh-market; in *mining,* niches or shelves placed at suitable distances, so that the ore, being thrown from one to another, is thus gradually raised to the top of the mine.

SHAME, n. *shām* [Icel. *skömm,* shame, dishonor; *skamma,* to dishonor: Dan. *skam;* AS. *sceamu,* shame, disgrace]: the uneasy sensation of mind produced by a consciousness of guilt or loss of reputation, or from the exposure of that which modesty prompts us to conceal; the pain or emotion arising from the thought of another person beholding us, or something connected with us, with contempt, indignation, or disgust; that which brings reproach, and degrades in the estimation of others; reproach; dishonor; disgrace; ignominy: V. to fill with shame; to cause to blush. SHA'MING, imp. SHAMED, pp. *shāmd.* SHA'MER, n. *-mĕr,* one who makes ashamed. SHAME'FACED, a. *-fāst* [a corruption of AS. *scamfæst;* OE. *shamefast,* that is, quick or *fast* in feeling shame]: easily confused; bashful. SHAMEFACED'LY, ad. *-fāst'lĭ.* SHAMEFACED'NESS, n. *-nĕs,* excess of modesty; bashfulness. SHAME'FUL, a. *-fŭl,* that brings shame; raising shame in others; disgraceful; unbecoming. SHAME'FULLY, ad. *-lĭ,* in a manner to cause shame; disgracefully; with indecency. SHAME'FULNESS, n. *-nĕs,* the state or quality of being shameful. SHAME'LESS, a. *-lĕs,* insensible to shame; done without shame; impudent; immodest. SHAME'LESSLY, ad. *-lĭ.* SHAME'LESSNESS, n. *-nĕs,* want of sensibility to disgrace or dishonor; immodesty. FOR SHAME! shame on you! you should be ashamed. TO PUT TO SHAME, to cause to feel shame; to inflict shame on.—SYN. of 'shameful': disgraceful; unbecoming; degrading; ignominious; infamous; vile; scandalous, reproachful; indecent;—of 'shameless': bold; audacious; impudent; unblushing; brazen-faced; indelicate; immodest; indecent.

SHAMMAI, *shăm-mī'* or *shăm'ma-ī* (not to be confounded with Sammeas): eminent doctor of the Jewish law at the time of Herod; head of a most important school, and supreme judge of the Sanhedrim (Ab-Beth-Din) during the presidency of Hillel (q.v.), with whom he is, indeed, generally mentioned, and of whom he was, as it were, the counterpart. Very little is known of his life. He was born probably in Palestine, and most energetically participated in all the political and religious complications of the country. There was a harshness and rigidity in his character which contrasts strikingly with Hillel's proverbial patience. His religious views were painfully strict, and he even tried to extend the rigor which he imposed on himself to the youngest children; but the zealotism with which later times have charged him is not his, but his school's, 'the House of Shammai,' as it was called. This seems, under the adverse circumstances of the commonwealth—sedition within, and the approaching enemy without—to have developed a fanatical zeal that at times sur-

passed all bounds, and tended to foster that exceptional exclusiveness which proved both the bane and the saving of Judaism. The discussions of the two rival schools, of which that of S. preponderated long after the master's death, turned exclusively on points of positive law. There is only one curious metaphysical debate recorded—viz., whether, as one school held, 'it was better for man to have been created or not;' or, as the other asserted, 'it would have been better if he never had been created.' Finally, they both agreed in the latter axiom, but with the addition—'but since he is now in this world, let him be careful in his actions.' This discussion and final decision throw a strange light on the times of unequalled national misery that begot them.

SHAMMY, n. *shăm'mĭ*, or SHAMMOY, or SHAMOY, n. *shăm'oy*, and SHAMOIS, n. *shăm'oys* [F. *chamois*, a wild goat, the skin of it dressed: It. *camoscio*, the chamois]: kind of leather, esteemed for its softness, pliancy, and quality of bearing soap without damage—originally made from the skin of a species of antelope, now also from other skins: see CHAMOIS: also LEATHER.

SHA'MO: see GOBI.

SHAMOKIN, *sha-mō'kĭn:* postborough in Northumberland co., Penn.; on the Lehigh Valley, the Northern Central, and the Philadelphia and Reading railroads; 18 m. s.e. of Sunbury, the co. seat. It is in a valuable anthracite coal region, and its chief industry is mining and shipping coal. It contains iron foundries and machine shops, waterworks supplied from Shamokin creek, 10 churches, public high and grammar schools, public library, 2 nat. banks (cap. $200,000), 1 sav. bank (cap. $50,000), 2 daily and 2 wkly. newspapers. Pop. (1890) 14,403; (1900) 18,202.

SHAMPOO, v. *shăm-pō'* [Hind. *tshampna*, to squeeze]: to rub and press the limbs and joints in connection with the hot or Turkish bath, after the eastern manner; to wash and rub the head, as in hair-dressing: N. the act or operation of shampooing. SHAMPOO'ING, imp.: N. the act or operation of rubbing and pressing the joints and limbs in connection with the hot or Turkish bath; also, the act of washing and rubbing the head. SHAMPOOED', pp. *-pōd'*. SHAMPOO'ER, n. *-ĕr*, one who shampoos.

The Shamrock.

SHAMROCK, n. *shăm'rŏk* [Ir. *seamrog*, trefoil]: the three-leaved white clover, or wild trefoil—national emblem of Ireland; the *Trifolium rĕpens*, ord. *Leguminōsæ*, or some plant of the nearly allied genera; others think it the Wood-sorrel, *Oxălis acetosel'lă*, ord. *Oxalĭdăcĕæ*, as it comes into flower about St. Patrick's Day; said to have been the sacred symbol of the anc. Persians. It is probable that the name has general reference to plants with trifoliolate leaves, and that a more exact determination of the species may be

as difficult as in regard to the emblematic thistle of Scotland.

The small-leaved clover (*Trifolium repens*) has had superstitious respect from early times. According to the elder Pliny, no serpent will touch it. It is said to have been assumed as the badge of Ireland, from St. Patrick's use of it to illustrate the doctrine of the Trinity. See TREFOIL.

SHAMYL, or SCHAMYL, *shăm'il* (Eng. 'Samuel'): celebrated leader of the independent tribes in the Caucasus; about 1798–1871, Mar.; b. at Aul-Himry, n. Daghestan; of a wealthy Lesghian family of rank. He was one of the zealous disciples of Kasi-Mollah, the great apostle of Muridism, and ably seconded his endeavors to compose the numerous feuds of the various Caucasian tribes, and unite them in a bond of antagonism to their common enemy, the heretical Russians. He was one of the foremost in the defense of Himry against the Russians, 1832, and after the fall of his chief, Kasi-Mollah, and most of his adherents, fought his way alone and severely wounded through the besiegers' ranks. After the assassination of Hamzad-Bey, successor of Kasi-Mollah, in the end of 1834, S. was unanimously elected 'imaum,' and being absolute temporal and spiritual chief of the tribes who acknowledged his authority, he made numerous changes in the religious creed and political administration, more fully concentrating in himself the whole power. These changes were certainly the chief cause of the great successes which subsequently attended the mountaineers, but they produced that sudden collapse of the spirit of independence which ensued when the great leader was removed. S.'s change of military tactics, from open warfare to surprises, ambuscades, etc., brought numerous, and sometimes great successes to the arms of the mountaineers. General Ivelitch was severely defeated 1837, the worst reverse that the Russians had yet sustained, and his coadjutor Hafi was forced to disastrous retreat. They succeeded, however (1839), in hemming S. into Akulgo, in Daghestan, took the fortress by storm, and put every one of the defenders to the sword, in order to be certain that S. should not escape. How he did so is not known; his own followers and the Russians believed him to be dead, when he suddenly appeared, preaching with more vigor than ever the 'holy war against the heretics.' In 1843, he conquered all Avares, besieged Mozdok, foiled the Russians in their subsequent campaign, and gained to his side the Caucasian tribes which had hitherto favored Russia. This accession of power rendered necessary some change in the government, a civil and a criminal code were promulgated, a regular system of taxation established, and Dargo was made the capital of this Caucasian monarchy, whose pop. (1844) exceeded 1,000,000. But the Russians, under Prince Woronzoff, having changed their tactics, assailed the country on various points at the same time, and the advance gained was secured by chains of forts. The fortune of war, however, steadily alternated till 1852, when Bariatinsky compelled S. to confine himself to the defensive, and deprived

him of his victorious prestige. Some of the tribes now returned under Russian authority, and S. (probably owing to his diminished power and resources) was unable to take advantage of the diversion in his favor afforded by the Crimean war; after which the Russians resumed their attacks with more energy, opened a road over the mountains, thus cutting off one portion of the patriots, and compelling their submission. The following year was still more disastrous; 100 villages were destroyed, the inhabitants transplanted to Russian districts, and S. himself defeated Aug. 11. 1859, Apr. 12, his chief stronghold Weden was taken after seven weeks' siege, and his authority, except over the small band of followers who still devotedly adhered to him, was destroyed. For several months he was a mere guerilla chief, hunted from fastness to fastness, till at last (1859, Sep. 6) he was surprised on the plateau of Gounib, and after a desperate resistance, in which his 400 followers were reduced to 47, he was captured. His wives and treasure were spared to him, and he was sent to St. Petersburg, where he met a generous reception from the czar. A few days afterward, he was assigned a residence at Kaluga, with a pension of 10,000 roubles. Thence he went 1870 to Mecca, remaining a paroled prisoner of the Russian government; and died at Medina.

SHANDYGAFF, n. *shăn'dĭ-găf* [etym. doubtful]: mixture of beer and ginger-beer.

SHANGHAI, *shăng-hī'*: most important maritime city of China, on the left bank of the Hwang-poo or Woo-Sung river, 12 m. from where it debouches into the s. portion of the mouth of the Yangtse-kiang, lat. 31° 14′ n., long. 121° 30′ e. Though it is now one of the first emporiums of commerce in the East, only a quarter of a century ago it was but a third-rate Chinese town. It is a *heen* or *district* city, having a wall 3 m. in circuit, though which 6 gates open into extensive suburbs. The low alluvial plain on which it is situated is of great extent, and intersected by innumerable creeks, which environ the walls, and permeate the city in various directions. It is a dirty, poorly-built town; the houses are of brick, the streets very narrow and constantly crowded with people. Few buildings rise above the low walls of the city; the only conspicuous objects are the Rom. Cath. cathedral, a massive edifice, and the lofty spire of the Bapt. chapel. The temples present the same general appearance as in all Chinese cities. Every city has its Ching-hwang, or temple of the tutelary gods; that of S. is in a picturesque position on a rocky islet, surrounded by a serpentine sheet of water crossed by zigzag bridges. A little further down the river are the foreign settlements, English, French, and American. All the mercantile *hongs* are built on the English concession; while the French concession is mainly occupied by *go-downs*, wharves, and Chinese houses. There are no French merchants in Shanghai. The river in front of the Chinese town is thronged with junks, lashed side by side for two miles. The reach in front of the foreign settlement was formerly crowded with sailing-vessels;

but since the opening of the Suez canal, steamers of the Peninsular and Oriental Steam Navigation Co. and of private companies have largely taken their place. Lower down are the ship-yards, machine-shops, and dry-docks, which foreign commerce has called into existence; and here the Chinese government has an arsenal where war-vessels of the largest tonnage are built and equipped. Under the arrangement by which the foreign custom-house dues are collected by foreigners, facilities have been created for navigation of the Yangtse by stationing a light ship, buoys, and signals, rendering safer the approach to this important mart. One or two light-houses also have been erected. There are a chamber of commerce, reading-room, library, and literary institution—nothing being lacking to render the port of Shanghai the metropolis of eastern commerce. The municipal government of the foreign settlement is highly creditable to the mercantile traders. Several gentlemen are elected annually by the land-holders, for the purposes of local government—police, public improvements, and repairs requiring much management, and entailing much expense, the funds for which are obtained by taxation. Shanghai is the seat of various Christian missions—whose schools, dispensaries, and other benevolent objects have generous support from foreign merchants. The products of Shanghai itself are not of much value; but the city is a most important entrepot for goods passing between the n. and s. provinces of China, as well as for imports and exports from and to foreign countries. It was in the possession of the Tae-ping rebels 1853-55, and the prosperity of the native town and the foreign settlements was in peril for a time; but it enormously advanced after their expulsion—the English quarter in particular becoming a refuge for the Chinese from all parts of the province of Kiang-su, which the Tae-pings continued to desolate till 1862. The trade of the port increased threefold 1860-63, owing to the large and increasing trade of the ports opened on the Yangtse. Shanghai was connected with Tien-tsin by telegraph 1881. Imports are valued at about $120,000,000 annually and exports at $60,000,000. The articles of import and export are most miscellaneous; chief imports being opium, English cotton and woolen goods, and metals; and chief exports, tea and silk. Great quantities of the opium imported into Shanghai are re-exported to other parts of China. The mercantile importance of Shanghai has increased greatly through the opening of the Yangtse river to commerce. In 1876 the first railway in China was opened from Shanghai to Kangwang, but it has since been bought up by government and closed. Pop. (1901) 620,000.

SHANK, n. *shăngk* [AS. *scanca*, the hollow bone of the leg, the shank: Dan. *skank*; Ger. *schenkel*, the shank: It. *zanca*, a leg]: the leg from the knee to the ankle, or the large bone of that part; the handle or long part of

any instrument; in *arch.*, the plain space between the two channels of the Doric triglyph; also, the shaft of a column: V. to sink or excavate a pit or shaft, as being the shank to the mine. SHANK'ING, imp. SHANKED, pp. *shăngkt:* ADJ. having a shank. TO SHANK OFF, to fall off, as flowers, through decay of the footstalk.

SHANNON, *shăn'on:* largest river of Ireland, rising in the Cuilcagh Mountains, county of Cavan, and after a course of 230 m. entering the Atlantic Ocean between the headlands of Loop and Kerry Head. It is commonly divided into two portions, the Upper Shannon from its source to Limerick; and the Lower Shannon from Limerick to the sea, 56 m. In its upper course it passes from its source in Cavan to Lough Allen in the county of Leitrim; thence through a difficult channel, where the navigation is in part transferred to a canal, to a small expansion called Corry Lough, and, with alternations of river and lake, to Lough Forbes, in the county of Longford, on leaving which the river for a time attains an average width of 250 yards as far as Lanesborough. Here it is again merged in a lake, Lough Ree, which stretches 10 m. to within 2 m. of Athlone. At this point great natural difficulties have been overcome, and the course of the river, by Shannon Harbor and Portumna, and through the picturesque Lough Derg to Killaloe, has been so deepened and improved that regular passenger and goods traffic is maintained. From Killaloe to Limerick navigation, owing to the rapid fall, is again in part transferred to a canal. Approaching Limerick the river divides into two branches, and on the island thus formed stands what is known as the Irish Town, in distinction from the English town, of Limerick. From the city, where an extensive and commodious range of quays has been built, to the sea, the Shannon is navigable to sea-going vessels; and though near the city very shallow at low water, the navigation for the last 40 m. is free at all tides. The entrance between Kerry Head and Loop is 7 m. across. About 10 m. from the entrance the river narrows to about a mile and a half in width. At present, however, the outward navigation commences at Foynes, which is connected by railway with Limerick, and from which steam-boats daily ply to Kilrush, Tarbert, and the intermediate stations. Several rivers of considerable size fall into the Shannon during its course, as the Suck, the Brosna, the Fergus, the Maigue, and the Feale. The improvement of the Shannon was begun under the Irish parliament. The navigation is open from the head of Lough Allen to Limerick, 143 m. in a direct course; but by the addition of the Boyle branch of 9 m. and the Strokestown branch of 6 m., a total length of river and canal navigation of 158 m. is now open, over 129 m. of which large river-steamers freely ply. This important system of navigation, midway between the e. and w.

coasts of Ireland, is connected with Dublin by the Grand and Royal canals.

SHANNON, WILSON: American politician; b. Belmont co., O., 1802, Feb. 24; d. Lawrence, Kan., 1877, Aug. 30. He had a collegiate and law training and began practice at St. Clairsville, O. In 1832 he became attorney for Belmont co. and in 1838 democratic governor of the state. After the interim of one term he was re-elected in 1842. During 1844-5, until the suspension of diplomatic relations, he was minister to Mexico by appointment of President Tyler; and after his return he practised law in Cincinnati. He was elected to congress in 1852, where he served on the committee on foreign affairs. In 1855 he was appointed by President Pierce to succeed Andrew H. Reeder as governor of Kansas. The contests of the pro- and anti-slavery factions among the people to gain possession of the legislature made the post an exceedingly onerous one, especially for one who endeavored to administer affairs impartially. He resigned in August of the following year. After the political troubles of Kansas had subsided he returned to the state to reside.

SHANNY, n. *shăn'nĭ* [etym. doubt.]: small fish allied to the Blenny; the *Blennius pholis* of Linnæus, and the *Pholis lævis* of modern authors. It is about 4 inches long, olive-green, with irregular black spots. There is no crest-like appendage on the head, and the notched dorsal is not continuous with the caudal fin. The incisors are long, and serve to detach limpets and mussels from the rocks. It will endure fresh water for a short time, and will live for many days out of water where the ground is moist.

SHAN-SE, *shân-sē'* (West of the Hills): province of n.w. China, of rugged surface, on the w. limits of the plain. In the n. are imperial hunting-grounds. It supplies the purest iron ore and the best coal in China, besides cinnabar, copper, marble, and other minerals. The rivers are numerous, but not large. The Fen-ho, the largest of these streams, is about 300 miles long, and falls into the Yellow river. Pop. 12,200,000.

SHAN STATES, *shân*, or THE SHANS, *shânz:* tributary states in Indo-China, between Munnipur on the w. and Yun-nan on the e., and from the parallel of 24° n. lat., s. to Bangkok and Cambodia. Of these the n. states are tributary to Burmah, and the s. to Siam. A great portion of the mountainous region of these states is called the Laos Country. The Laos races are divided into two curiously distinct sub-divisions. The n. race, beyond the n. frontier of Siam, are called *Black-bellies*, from the circumstance that they tattoo themselves with figures in ink, printed on their bodies with sharp needle-like points; the s. race, mostly on and within the e. frontier of Siam and tributary to that kingdom, are called *White-bellies*, and do not tattoo. Xieng Mai, capital of Laos, stands

on a wide plain on the right bank of the Meinam, 500 m. n. of Bangkok, and is said to have pop. 50,000. The number of Laocians included in Siam alone is estimated at 1,000,000. They are meek, gentle, unwarlike, and superstitious. Their chief employment is agriculture; and the principal crops are rice, maize, sweet potatoes, calabashes, red pepper, melons, and other fruits. In religion they are Buddhists.

SHAN'T, v. *shănt:* a familiar corruption of *shall not.*

SHAN-TUNG: China; a northern maritime province bounded n. and w. by Chi-li, s.e. by the Gulf of Pe-chi-li, and the Yellow Sea; and s. by Kiang-su and Ho-nan; area, 55,970 sq.m. The greater portion of this province is level, but the peninsular parts of it are hilly. The shores are generally bold, and full of indentations, some of which are excellent harbors. Wei-hai-wei leased to the British, Kiao-chau leased to Germany, and the native towns Teng-chau and Chi-fu are the only important seaport towns along the entire coast. The province is intersected by several rivers. The only large one flowing direct to the sea is the Yellow river or Hwang-ho, which, after traversing the province in a n.e. direction, flows into the Gulf of Pe-chi-li. The inland navigation is augmented by the grand canal which traverses the w. part of the province n.w. to s.e., affording great trading advantages, and the transit trade is extensive. Drugs and vast quantities of vegetables are exported; and felt caps, carpets, and some coarse hempen cloths are manufactured. The province is over-peopled, and the great proportion of the people are poor; still they appear to be contented, and attach peculiar importance to this province, on account of its being the birthplace of Confucius and his disciple Mencius; and also because it contains the Tai-shan, or Great Mount, which forms a favorite resort of devotees from amazing distances. Its capital is Tsi-nan. Pop. 38,247,900.

SHANTY, n. *shăn'tĭ* [said to be from Gael. or Ir. *sean,* old; *tig* or *tigh,* a house]: in *Ireland,* the name for a hut or hovel; a mean temporary building.

SHAPE, n. *shāp* [Icel. *skapa;* Dan. *skabe;* Dut. *schæpen,* to form: Norw. *skap,* form, shape]: form or figure of a thing; a mold or cast; pattern; form; external appearance; idea: V. to reduce to a particular form or figure; to fashion; to form; to adapt to a purpose; to regulate; to contrive; to direct; in *OE.,* to square; to suit. SHA'PING, imp.: ADJ. creating; giving form to; forming in the mind. SHAPED, pt. *shāpt.* SHAPEN, pp. *shā'pn.* SHAPE'LESS, a. *-lĕs,* destitute of regular form. SHAPE'LESSNESS, n. *-nĕs,* the state of being shapeless; want of any regular form. SHAPE'LY, a. *-lĭ,* symmetrical; well formed. TO TAKE SHAPE, to become embodied; to begin to take a definite form. SHIP-SHAPE, a. or ad. having the orderly arrangement of

a ship; in good trim.—SYN. of 'shape, v.': to form; mold; cast; regulate; adjust; image; conceive; make; create; fashion.

SHAPINSHAY, *shăp'ĭn-shā:* one of the Orkney Islands, about 5m. n.e. of Kirkwall; 5 m. long, 4½ m. in extreme breadth. The fine natural harbor of Elwick Bay on the s. side is overlooked by a pleasant modern village. Pop. 1,100.

SHARD, n. *shârd* [Dut. *schærde,* a breach, a piece of broken pottery: Low Ger. *skaard;* Ger. *scharte;* Icel. *skard,* a notch, a cut]: a broken piece of tile, or of some earthen vessel; the wing-cover of an insect; the shell of an egg or a snail: same as SCARD. SHARD'ED, a. sheath-winged, as a beetle. SHARD-BORNE, in *OE.,* borne through the air by sheathed wings.

SHARE, n. *shär* [AS. *scearu,* a share; *sceran,* to cut off, to divide: Low Ger. *scheren,* to separate, to tear away: Dan. *skære,* to cut]: a part or portion of a thing owned by several individuals in common; one of the transferable parts of a joint-stock undertaking, as a bank, a railway, etc.; an allotment; a portion; a part contributed; the sharp triangular piece of a plow immediately behind the colter, which cuts under the soil and raises up the furrow-slice cut off by the colter: V. to part or distribute among two or more; to partake of or enjoy with others; to have part, or a dividend; to experience. SHAR'ING, imp. SHARED, pp. *shärd.* SHAR'ER, n. *-ėr,* one who participates; one who enjoys or suffers in common with another. TO GO SHARES, to be equally concerned. SHARE-BONE, in *anat.,* a bone at the upper and fore part of the pelvis; the pubis. SHARE-BROKER, n. *-brō'kėr,* a dealer in railway and other shares and securities. SHAREHOLDER, n. *-hōld'ėr,* one who holds one or more shares in a joint-stock company.

SHARI, *shâ'rē* [i.e., river]: principal feeder of Lake Tsad or Tchad (q.v.).

SHARJAH, or SHARJA, *shâr'jâ:* town, capital of the province of Shari in Oman, Arabia; on the Persian Gulf; lat. 25° 20′ n., long. 55° 36′ e.; about 215 m. n.w. of Muscat or Mascat. Although Sharjah has a poor harbor, it has commercial importance, Persia receiving most of her imported goods through it; and it is the principal place on the coast for sale of metals, cotton, wool, dromedaries, and asses, and the chief mart for the slave trade, in which a large part of the inhabitants of the province, which is virtually independent of the sultan of Muscat, is or has been engaged. There is a market-place in the town, in the center of which stands the government treasury, a substantial building, carefully guarded. Many of the residents are weavers, manufacturing carpets, tapestries, cloaks and curtains, which with Indian and Persian goods are profusely displayed in the shops. Pop. of province 85,000; of town about 25,000.

SHARK, n. *shârk* [Gr. *karcharias*, a shark—from *karcharos*, sharp-pointed: comp. Ger. *schurke*, a rogue: It. *scroccare*, to trick, to cheat, to live by wit: F. *escroquer*, to cheat, to swindle—*lit.*, one who clutches greedily after]: large voracious sea-fish of many species (see below): an artful fellow who lives by shifts and tricks; a greedy and rapacious one; one ready to seize every advantage; a sharper: V. to clutch greedily after; to live by shifts and petty tricks; in *OE.*, to pick up hastily or slyly. SHARKING, imp.: N. petty tricks or rapine; the seeking of a livelihood by petty tricks and devices. SHARKED, pp. *shârkt*. SHARKER, n. *shârk'ér*, one who lives by sharking.

SHARK (*Squalus*): Linnæan genus of cartilaginous fishes, now forming in Müller's system a sub-order of *Plagiostomi* (q.v.), divided into a number of families and many genera. The sharks have generally an elongated form, tapering gradually to the tail, and not much thickened in the middle. The muzzle projects over the mouth; the nostrils are on the under-side of the muzzle. The males have claspers. The gill-openings are lateral. There is no cartilage between the snout and the pectoral fin, as in the rays. Some of the sharks are ovoviviparous; others lay eggs, generally a pair at a time, more being produced in succession. The eggs are large in comparison with those of osseous fishes, and are square or oblong, with a tough horny coat, each corner prolonged into a tendril, the tendrils being apparently of use for their entanglement among sea-weeds. These eggs, or at least their empty cases, are frequently cast up by the waves on the sea-beach, and are popularly known as *Sea Purses* or *Mermaids' Purses*. Near the head of the inclosed embryo there is a slit in the case through which water enters for respiration, and there is another at the opposite end, by which it is discharged. The young fish ruptures the case at the head where it is weaker than at any other part, and on issuing from it, carries a yolk-bag attached to its belly for nourishment until it is able to seek food. At this stage of its existence, its respiration is aided by filaments projecting from the gills through the gill-openings, which are absorbed as it grows older. The teeth are generally large, sharp, and formed for cutting, with the edge often serrated; but in the genus *Cestracion* (q.v.) the teeth are pavement-like; and in some genera they are small and numerous. The Angel-fish (q.v.) is ranked among the sharks, but differs from the rest in its flattened form. Some of the smaller sharks are popularly known by the names Dogfish, Hound, Tope, etc. See CESTRACION: DOGFISH: FOX SHARK: HAMMER-HEAD: PORBEAGLE: TOPE. Here are noticed a few of the more interesting of those which do not come under any of these heads.

The WHITE S. (*Carcharias vulgaris*) is the most dreaded of all monsters of the deep. The family *Carcharidæ*, to which it belongs, have two dorsal fins, the first dorsal placed over the space between the pectoral and ventral fins; they have a nictitating membrane; and have no spout-holes. In the genus *Carcharias* the snout is flattened. The white S. attains great size, one has been caught 37 ft. in

The rough skin of sharks is employed by joiners for polishing fine-grained wood, and for covering hilts of swords to make them firmer in the grasp.—The flesh is coarse but is sometimes eaten. The fins abound in gelatine, and are much used by the Chinese for making a rich gelatinous soup. Dried sharks' fins are a considerable article of import into China. The liver yields a large quantity of oil, which is now in some parts of the world an article of commerce. For the sake of this oil a S. fishery is prosecuted on the coast of Ceylon.

Fossil Sharks make their first appearance in the Oolitic rocks, from which eight species have been described. They become more numerous in the Cretaceous deposits, in which no less than 60 species have been found. In the Tertiary strata, their remains are still more abundant. But as the determination of fossil species depends entirely on the teeth, which, with the exception of the spines and vertebræ, are the only portions preserved, it is probable that the species and genera are too greatly multiplied.

SHARKIE, n. *shâr'kĭ* [Port. *charque*, dried meat: F. *charcuterie*, spiced and partly cooked meat, as ham and sausage: comp. Gael. *searg*, dried up (see JERK)]: dried and preserved meat imported from S. America.

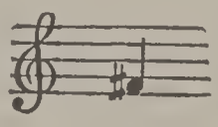
SHARON, *shär'on:* post-borough in Mercer co., Penn.; on Shenango river, and on the New York Lake Erie and Western, the Erie and Pittsburgh, and the Lake Shore and Michigan Southern railroads; 41 m. s.s.w. of Meadville. It is noted for its iron mines and manufactures; has 3 rolling mills, 4 blast furnaces, brass foundry, boiler and machine shops, and nail factories; and contains gas-works, fire dept., high school, union public schools, opera-house, 1 nat. bank (cap. $125,000), 1 private bank, and 2 weekly newspapers. Pop. (1890) 7,447; (1900) 8,916.

SHARON SPRINGS, *shär'on*, village and summer resort in Schoharie co., N. Y.; on the Delaware and Hudson Canal Co.'s railroad; 59 m. w. of Albany. It is surrounded by high hills and beautiful scenery; has chalybeate, magnesia, white sulphur, and blue sulphur springs; and contains 3 churches, and numerous hotels and boarding houses. Within easy reach is Tekeharawa Falls, in a secluded hemlock ravine; and 20 m. away by railroad is the remarkable Howe's Cave, now explored 7 m. Pop. (1890) 622; (1900) 567.

SHARP, a. *shârp* [AS. *scearp;* Icel. *skarpr;* Sw. and Dan. *skarp;* Dut. *scherp;* Ger. *scharf*, sharp: AS. *sceran*, to cut]: having a keen edge or a fine point; bent at an angle less than a right angle; acute of mind; of quick or nice perceptions; acid; pungent; shrill; not flat, as sounds; biting or piercing, as the wind; harsh, fierce, or severe, as words; severe, as an illness; characterized by keenness or severity; keenly attentive to one's own interest; unfair; severely rigid; vigilant; knavish; narrow; lean; hard, as sand: N. in *music*, a character which raises a note a semitone, and marked thus, ♯ (see below): V. in *OE.*, to render quick; to make keen; to mark with a sharp. SHARP'ING.

imp. SHARPED, pp. *shârpt.* SHARPS, n. plu. meal from which the flour has been sifted. SHARPEN, v. *shârp'n*, to make sharp or keen; to render quick or eager; to make quicker of sense; to make eager or hungry; in *music*, to raise a note a semitone; to make sharp or acid; to become sharp; in *OE.*, to make fierce or angry; to make sour. SHARPENING, imp. *shârp'nĭng.* SHARPENED, pp. *shârp'nd.* SHARPER, n. *shârp'ĕr*, one who resorts to any means, however disreputable, of obtaining money; a tricky fellow; a cheat; a swindler. SHARP'LY, ad. *-lĭ.* SHARP'NESS, n. *-nĕs*, keenness of an edge; acidity; pungency; severity of language; acuteness; painfulness; intellectual acuteness; ingenuity; wit; doubtful honesty. DOUBLE SHARP, in *music*, a character which raises a note two semitones, and is marked thus, ×. SHARP-EDGED, having a fine keen edge. SHARP-SET, eager in appetite or desire; affected by keen hunger. SHARP-SHOOTER, n. a skilled marksman; formerly a term in the army for a rifleman; now, in naval usage, one of the men stationed in the top to pick off those on an enemy's deck. SHARP-SHOOTING, n. a shooting with great precision; a keen contest of wit or argument. SHARP-SIGHTED, having acute sight; shrewd; discerning. SHARP-VISAGED, having a sharp or thin face. SHARP-WITTED, having an acute and nicely discerning mind.—SYN. of 'sharp, a.': keen; piercing; acute; witty; ingenious; inventive; quick; sour; acid; shrill; severe; harsh; biting; sarcastic; cruel; eager; hungry; painful; afflictive; fierce; ardent; fiery; attentive; vigilant; acrid; pinching; subtle; nice; hard; emaciated; lean; penetrating; sagacious; discerning; shrewd; tart; pungent; poignant; acrimonious; cutting; bitter; violent.

SHARP: sign ♯ in Music, which, prefixed to a note, elevates it by a semitone in the scale, raising, e.g.,

F to F sharp  . When placed

at the beginning of a piece of music, it denotes that all the notes on the line or space on which it is placed, and their octaves above and below, are to be played sharp. A double sharp × raises a note two semitones.

SHARP, GRANVILLE: 1734–1813, July 6: English philanthropist and author: b. Durham; grandson of Abp. John S. He gave up his place in a war office, because opposed to the American war. In 1771 he brought before the lord mayor the case of a slave, claimed by a master who, two years before, had cast off the slave as sick and useless, after bringing him to London. The master not heeding the mayor's decision in favor of the negro, S. took the case to the court of king's bench, where it was decided 1772 that the slave was free. Among his pamphlets and book publications are—*Tract on Duelling* (1773); *The People's Natural Rights to a Share in the Legislature* (1774); *The Law of Liberty* (1776); *The Law of Retribution* (1776).

S. made repeated donations of books to Brown University. He died in London. See *Memoirs* by Charles Stuart (New York 1836).

SHARP, JAMES: archbishop of St. Andrews: 1618, May—1679, May 3; b. in the castle of Banff, Scotland; son of William Sharp, sheriff-clerk of Banffshire. Educated for the Presb. ministry at the Univ. of Aberdeen, where he attained distinction as a student, and where he is said (on the authority of a tract, entitled *A True and Impartial Account of the Life of the Most Reverend Father in God, Dr. James Sharp, Archbishop of St. Andrews*, pub. 1719) to have protested against the 'Solemn League and Covenant;' he afterward visited England, and returning to Scotland, was appointed a prof. of philosophy at St. Andrews, and soon afterward minister of the parish of Crail, an office which he held during the ascendency of Cromwell. 1651, Aug., when Monk was reducing Scotland to obedience, he was carried off, with several other ministers, to England. S. quickly regained his liberty, and he possessed for some years the confidence of the more moderate party in the church. In 1656, he was chosen by them to plead their cause in London before the Protector, against the Rev. James Guthrie, leader of the extreme section (the Protestors or Remonstrators), which he did with so much dexterity, that Cromwell is reported to have said: 'That gentleman, after the Scotch way, ought to be termed Sharp of that Ilk.' On the eve of the Restoration S. was appointed by the moderate party its representative in the negotiations opened with Monk and the king, This is the crucial period of his career, and on the view that we take of his motives depends our whole estimate of his character. Was he sincere, or did he mean to betray the church to which he owed allegiance? Presbyterian writers are nearly unanimous in affirming his perfidy, though the evidence is doubtful. Among the first things that the Scottish parliament that met 1661, Jan. 1, did, was to repeal or rescind every act passed since 1638, in consequence of which Episcopacy remained the form of Church of Scotland, as 'settled by law'—a dishonorable evasion of a promise made by Charles in his letter to the Presbytery of Edinburgh 1660, Aug. Soon afterward at a council in Whitehall, S. was nominated Abp. of St. Andrews; and having gone up to London, he was there formally consecrated by the bp. of London and three other prelates. His government of the Scottish Church was tyrannical and oppressive; in consequence he became an object of hatred to most of his countrymen. When one Mitchell, a conventicle preacher, fired a pistol at him in the streets of Edinburgh, the populace allowed the intending assassin to walk quietly off, without making a single effort to arrest him. Finally S. was assassinated on Magus Moor, near St. Andrews, by a band of fanatical Covenanters. In defense of S., the utmost that can be said is that he was simply an ambitious ecclesiastic (of plausible and courtly manners), who had no belief in the 'divine right' of Presbytery, and who thought that if England were resolved to remain Episco-

palian, it would be much better if Scotland were to adopt the same form of church government.

SHARPIE, n. *shâr'pĭ:* long, sharp, flat-bottomed sailing boat.

SHARPS'BURG, BATTLE OF: Confederate name for ANTIETAM, BATTLE OF (q.v.).

SHARPSBURG: Pa.; borough in Allegheny co.; on the Allegheny river, and on the Pittsburg & W. and the Pennsylvania railroads.; 6 m. n.e. of Pittsburg. It is in a coal-mining region. The chief industrial establishments are foundries, blast furnaces, rolling mills, machine shops, bottle works, planing mills, wire and brick works. Other manufactures are oil cans, varnish and japan, chemicals, coal-mining tools, and oil-well machinery. It has large coal yards, and exports annually a large amount of coal and of steel and iron products. It has a high school, public and parish elementary schools, and a public library. Pop. (1900) 6,842.

SHARP-SHOOTERS: the name formerly given to the best shots of a company, who were armed with rifles, and took aim in firing. They are superseded by the better arms and more complete organization of modern armies.

SHARP-TAILED GROUSE: the northern prairie-chicken, a grouse (*Pediœcetes phasianellus*), which has the general habits of the pinnated grouse, but differs among other features in lacking the neck-tufts, in the characteristic form of the tail, in which the central pair of quills are soft, parallel-edged and square-tipped, projecting an inch or two beyond the next pair. It is somewhat more fond of brushy places, and flies more, than does the pinnated grouse, which is steadily encroaching on its northwestern habitat.

SHASTA, MOUNT: a peak of the Sierra Nevada range, in Siskiyou co. in California. It is of volcanic origin; about 14,350 feet above sea level, and on its summit are three glaciers, one of which, Whitney, is 3 m. long. On the slope and near the base are large trees, some 300 feet high. The mountain is conical in form and has been a dormant volcano for a long period.

SHASTERS, n. *shăs'tėrz,* or SHAS'TRAS, n. *-trăz* [Hind. *shas,* to govern]: *literally,* ordinances; authoritative writings, or sacred laws or institutes, of the Hindus. See SASTRA: also SANSKRIT LITERATURE.

SHATTER, v. *shăt'tėr* [a form of SCATTER: Dut. *schetteren,* to crack, to scatter with noise: Swiss, *schattern,* to rattle like a heavy fall of hail]: to break into many pieces at once; to dash into fragments; to break up the unity or vigor of; to overthrow; to derange; to dissipate; to be broken into fragments. SHAT'TERING, imp. SHAT'TERED, pp. *-tėrd:* ADJ. broken or dashed to pieces. SHAT'TERS, n. plu. *-tėrz,* the fragments of anything broken or rent. SHAT'TERY, a. *-tėrĭ,* brittle; easily fall-

ing into many pieces. SHATTER-BRAINED, wild, disordered in intellect; scatter-brained.

SHATTUCK, *shăt'tŭk*, GEORGE CHEYNE: 1783, July 17 —1854, Mar. 18; b. Templeton, Mass. He graduated from Dartmouth College 1803, and became a successful physician in Boston, and president of the Massachusetts Medical Society. He built and equipped an observatory at Dartmouth College; gave liberally to the Shattuck Protestant Episcopal Collegiate School for Boys at Faribault, Minn.; and at his death devised $60,000 for charitable purposes.

SHATTUCK SCHOOL, THE: a noted college preparatory school at Faribault, Minn., organized in 1865 and controlled by the Protestant Episcopal Church. The corporate name of the Shattuck School and the Seabury Divinity School, which is also at Faribault, is the 'Bishop Seabury Mission.' The school has 16 instructors and 200 students. The school course is divided into five forms of one year each, and the establishment is managed on the house system. Military drill is obligatory, and there is a cadet corps with four companies, and an artillery platoon with two detachments. The principal buildings connected with the school are the chapel, Shumway, Morgan, Smyser and Whipple halls. The school was named in honor of one of its earliest benefactors, Dr. George Shattuck, the founder of Saint Paul's School, Concord, N. H., and its head master from 1867 has been the Rev. James Dobbin. Since its organization the school has graduated some 2,000 students. Consult: Adams, *Some Famous American Schools.*

SHAVE, v. *shāv* [Dut. *schaven,* to scrape: Dan. *skave;* Icel. *skafa,* to scrape: Ger. *schaben;* L. *scabĕrĕ,* to scrape, to scratch]: to pare off from a surface with an edged tool; to cut off close to the surface; to remove growth of hair from chin, etc., with a razor; to cut off thin slices; to strip; to fleece; to oppress by extortion; to skim along a surface: N. an edged tool for shaving wood, as hoops, etc.; the act or process of removing the hair from the chin, etc.; in *Scot.,* a slice, as of bread. SHA'VING, imp.: N. the act of paring a surface; a thin slice pared off with an edged tool. SHAVED, pt. pp. *shāvd,* or SHAVEN, pp. *shā'vn.* SHA'VER, n. *-vėr,* a barber. SHAVELING, n. *shāv'lĭng,* a monk, in contempt. SHAVING BRUSH, a brush used in lathering before shaving. A CLOSE SHAVE, *familiarly,* a narrow escape. SHAVEN AND SHORN, having clean-shaven face and closely cropped hair.

SHAVE, n. *shāv* [a familiar application of SHAVE 1]: in *slang,* a trick; a piece of cheating or extortion: V. to cheat; to raise a false claim wilfully; to charge in excess of the regular price. SHAVER, n. *shā'vėr,* one who is close and sharp in bargains, or to his own interest; a sharp dealer; a cunning fellow; a young man, in contempt. A YOUNG SHAVER, a sharp lad.

SHAVE'GRASS. See EQUISETUM.

SHAW, n. *shaw* [see SCHAW]: in *Scot.* and *OE.*, a wood or thicket. SHAWS, n. plu. in *Scot.*, the foliage of esculent roots, as potato-shaws.

SHAW, ALBERT, PH.D., LL.D.: journalist: b. New London, O., 1857, July 23. He received education at Iowa College and at Johns Hopkins University. He joined the editorial staff of the Minneapolis *Tribune* 1884, holding that position until 1891, when he became chief editor and manager of the American edition of *The Review of Reviews.* In 1888-9 he traveled extensively in Europe. Among his published works are: *Local Government in Illinois* (1883); *Icaria: A Chapter in the History of Communism* (1884); *Cooperation in a Western City* (1886); *The National Revenue* (1888); *Municipal Government in Great Britain* (1895); and *Problems of American Development* (1907).

SHAW, GEORGE BERNARD: Irish dramatist and critic: b. Dublin, 1856, July 26. He went to London in 1876, engaged in socialistic agitation, and in 1884 became one of the founders of the Fabian Society. To the volume of *Fabian Essays in Socialism* (1889) he contributed *The Basis of Socialism* and *The Transition to Social Democracy.* During 1886-94 he wrote musical and art criticisms for the *World, Truth,* and the *Star.* In 1895-6 he contributed dramatic criticism to the *Saturday Review,* and arrested attention by the vigor and severity of his judgments. In 1892 his first play, *Widower's Houses,* was produced at the Independent Theatre, and was published as Volume I. of the Independent Theatre series of plays. Between 1880 and 1883 he published several novels, such as *The Irrational Knot; Love Among the Artists; Cashel Byron's Profession;* and *An Unsocial Socialist.* Two volumes of interpretative studies, *The Perfect Wagnerite* and *The Quintessence of Ibsen,* deal with the works of Wagner and Ibsen, the former especially concerning itself with Wagner's chief work, *The Ring of the Niblungs.* In 1898 he published two volumes of *Plays Pleasant and Unpleasant,* containing the *Widower's Houses; the Philanderer* and *Mrs. Warren's Profession; You Never Can Tell; Arms and the Man; Candida* and *The Man of Destiny.* In 1900 appeared *Three Plays for Puritans.* Other publications are: *The Admirable Bashville* (1901); *Man and Superman* (1903); *The Common Sense of Municipal Trading* (1904). He is fearless, vigorous, and witty, a master of irony, and is unhampered by the traditions either of the theatre or of literature. As a dramatist, he is resourceful in effective situations; but his plays appeal to a limited public. Consult his preface, *Mainly About Myself,* to Volume I. of *Plays Pleasant and Unpleasant* for statement of his point of view.

SHAW, HENRY WHEELER (pen-name JOSH BILLINGS): 1818-1885, Oct. 14; b. Lanesborough, Mass. Starting out

at the age of 15 in search of fortune, he led an unsettled life for several years. He tried farming, running a steamboat on the Ohio, store-keeping, and teaching, but was unsuccessful in all. He drifted back east and settled in Poughkeepsie, N. Y., 1858, as an auctioneer. His contributions to the newspapers, under the pen-name 'Josh Billings,' brought him liberal returns. His writings are characterized by a quaint shrewdness, and a humorous element intensified by the crude phonetic spelling which he adopted. He lectured throughout the country, and in addition to his sketches, issued in four vols., published an annual almanac. He died at Monterey, Cal.

SHAW, JOHN: American naval officer: b. Mount Mellick, Ireland, 1773; d. Philadelphia, Pa., 1823, Sept. 25. After serving on American merchant ships he commanded the schooner Enterprise of the United States navy, and in 1799, Dec., started on an eight months' cruise, during which he engaged in five actions with the French, recapturing 11 American prizes and taking 5 French privateers. In one hour's combat he forced the Flambeau, a French vessel of 100 men and 14 guns, to surrender after half of her men were killed or crippled, while the Enterprise had sustained a loss of but 10. Shaw was raised to the rank of captain; in 1811 he directed the defenses of New Orleans, La., and in 1813 commanded the naval force which recaptured Mobile, Ala., subsequently seeing other service both at home and abroad.

SHAW, LEMUEL: American jurist: b. Barnstable, Mass., 1781, Jan. 9; d. Boston, Mass., 1861, Mar. 30. He was graduated at Harvard University in 1800 and became prominent in the practice of law in Boston. He sat in the Massachusetts House of Representatives and Senate 1811-16 and in 1819, and in the State Senate 1821-2 and 1828-9, and was a member of the state constitutional convention of 1820. As chief justice of the Massachusetts Supreme Court 1830-60, he won a high reputation as a jurist. His publications include addresses and orations.

SHAW, LESLIE MORTIER, LL.D.: American lawyer and politician: b. Morristown, Vt., 1848, Nov. 2. He was graduated from Cornell College, Mount Vernon, Iowa, in 1874, and from the Iowa College of Law in 1876; was admitted to the bar and established a law practice in Denison, Iowa. He was also prominent in local financial circles, and became president of the bank of Denison, and of the bank of Manilla, Iowa. In 1898 he was president of the International Money Conference in Indianapolis, Ind. In the same year he was republican candidate for governor, and was elected after an active campaign in which he spoke frequently in all parts of the state. In 1902 he was re-elected, but resigned the governorship to become secretary of the treasury in President Roosevelt's cabinet. He held the position until 1907, when he resigned to engage in business.

SHAW, Richard Norman, r.a.: architect: b. Edinburgh 1831. While working at his profession in the office of Mr. William Burn, he studied at the Royal Academy, from which, 1852, he received the silver medal and a special prize of books, and 1853 the gold medal; in 1854 he was elected the traveling student for two years. He is author of *Architectural Sketches from the Continent,* published soon after his return from his travels, and he has furnished the designs for a large number of important public and private buildings in England. In 1872 he was elected an associate of the Royal Academy, and 1878 an academician.

SHAW, Robert Gould: 1837, Oct. 10—1863, July 18. He was educated at Harvard College. At the breaking out of the civil war he entered the 7th N. Y. regiment, but was transferred the next month to the 2d Mass. regiment. He was promoted captain 1862, and colonel 1863 in command of the first regiment of colored soldiers from a free state. He was killed while leading his colored troops in the assault on Fort Wagner. Edmonia Lewis, the colored sculptor, has made his bust. This young officer, cultured and refined, is remembered as a type of heroic self-sacrifice, commending to public regard a previously derided line of action.

SHAW, Samuel: 1754, Oct. 2—1794, May 30; b. Boston. He was commissioned lieutenant, and served through the revolutionary war, reaching the rank of major; became chief clerk of the war department 1785; first U. S. consul to Canton 1786. He made several voyages between this country and China, and died at sea while returning to Boston. Josiah Quincy published his *Journal,* with sketch of his life (1847).

SHAWANESE, a. *shaw-wa-nēz',* or Shawnese, a. *shaw-nēz':* of or belonging to the Shawnees, a tribe of N. American Indians.

SHAWANGUNK, *shŏng'gŭm,* Mountains: a range belonging to the Appalachian system, in the s.e. part of N. Y., in Orange, Sullivan, and Ulster cos.; height about 2,000 ft. The rocks and lakes of this region are in many places startlingly picturesque.

SHAW'FOWL, n. [*shaw,* a form of *show*]: an artificial fowl made by fowlers to shoot at.

SHAWL, n. *shawl* [F. *châle;* Pers. *shál,* a shawl]: large piece of cloth of various textures and degrees of fineness, worn over the shoulders and around the person by females; an article of dress worn in the East by both sexes in various ways. Shawled, a. *shawld,* wrapped up in, or covered with, a shawl.—The *shawl* is an important article of eastern manufacture. Perhaps no garment is of higher antiquity; indeed, its simplicity of form would lead us to infer that it was the earliest in use. But of its manufacture we have no distinct account until the reign of Emperor Jelaled-din-Mohammed Akbar, 1556, when the cele-

brated Cashmere shawls were among the most important manufactures of the world, and were thought worthy to be minutely described in the *Ayin-i-Akbari*, or 'Institutes of the Emperor.' In that work, four distinct classes of shawls, all of goat's wool, are described. The 1st were of remarkable lightness and softness, usually self-colored, and made of the wool undyed; the 2d were woven of wool in the natural colors—viz., white, black, and gray—these were probably arranged to form a plaid pattern similar to the shepherd's plaid of Scotland, which is of oriental origin; the third were called *gold-leaved*, probably from being embroidered with that material; and the 4th were long shawl-pieces large enough to enwrap the whole body. So carefully was this manufacture fostered, that it received the chief attention of the emperor, and every shawl manufactured was carefully described and registered; and the number of manufacturers was so great that in Lahore alone it is stated there were more than 1,000. The manufacture, in later times, passed through many vicissitudes, and during the 18th c. it declined greatly; but in 1809 it had again risen and there were then about 16,000 looms at work. From 2,000 to 3,000 of these beautiful fabrics have been annually imported into Great Britain; but the admirable imitations now produced by the Paisley manufacturers, and by the French, are exerting great influence over the trade. The true Cashmere shawls are woven in many pieces, and joined together with great artistic skill; those of Britain and France are woven in one piece, the loom being worked by hand, and of course furnished with a Jacquard machine for production of the pattern. Besides the Cashmere shawls and their European imitations, there is an infinite variety of shawls made of various materials—as silk plain, embroidered, and in the form of crape; thread, cotton, and silk lace; and wool in numerous styles.

SHAWM, or SHALM, n. *shawm* [OF. *chalemie*, a pipe made of a reed: F. *chaume*, a straw—from L. *calamus*, a reed]: a loud-sounding instrument made of a ram's horn; a musical instrument resembling the clarionet; the Prayer-book word for *cornet* in Ps. xcviii. 6, A. V.

SHAWNEES, *shaw-nēz'*: tribe of Algonquin Indians, recently identified with the Kickapoos. The first traces of them are found on the Fox river, Wisconsin, 1648. They traveled s. and e., and, driven before the Iroquois, settled along the Cumberland river, whence some roamed to North Carolina and Florida. One band settled in Pennsylvania, and was a party to the treaties with Penn 1682 and 1701. The Florida bands returned n., and in North Carolina were known as the Savannahs or Yemassees. Afterward most of the Shawnees were driven west, and are found on the Scioto and in Missouri. They were on the side of the French in the early struggles, took part in Pontiac's war, and were leaders in the confederacy

of tribes that fought at Point Pleasant 1774. After the revolution, incited by the English, they kept up hostilities in the west till subdued by Gen. Wayne, when they joined in the treaty of Greenville, 1795. The Shawnee chief Tecumseh attempted a confederation of the northwestern Indians against the whites, but his plans were defeated by Gen. William H. Harrison in the battle of Tippecanoe. In the war of 1812 Tecumseh aided the British. The Ohio Shawnees took no part in the war. In 1831 they sold their lands, and with the Missouri bands settled on a reservation in what is now Kansas. Their tribal relations were dissolved 1854. In 1890 there were 79 Shawnees in the Quapaw agency, Indian Territory, and 640 in the Sac and Fox agency, Oklahoma. They have become fairly civilized under missionary labors.

SHAW UNIVERSITY: an institution for the education of the colored race at Raleigh, N. C. It was founded under the auspices of the American Baptist Home Mission Society primarily for the education of colored preachers for the Baptist ministry. Henry Martin Tupper, D.D., was appointed president, and organized the first classes in 1865, in a negro cabin on the outskirts of the city; in 1866, Mar., was formed the first class for colored women, and thenceforth the school has been for both sexes. In 1870 the present campus, including a whole city block, was purchased for $15,000; the buildings were put up with brick made by the students. The university obtained a charter from the state legislature in 1875. The organization of the university includes the Normal, Collegiate, Scientific and Industrial departments, the Theological School, the Missionary Training School, the Leonard Schools of Medicine and Pharmacy, and the Law School. The collegiate department includes a preparatory course of two years; the regular college course is four years; the degrees of A.B. and B.S. are conferred. Music is a part of the curriculum. The course in the medical school occupies four years; the Leonard Medical Hospital is a part of the university. Industrial training and work has been a feature from the first, each student is required to do some kind of manual work, and training is given in carpentering, cabinet, bent iron and machine-shop work, mechanical drawing, architecture and blacksmithing, sewing, dressmaking, laundering, and domestic science. There is also a summer school and a night school (established 1899). The buildings include Estey Hall, Shaw Hall, the chapel, the medical dormitory, administration building, industrial building, laundry, Leonard Medical Building, Hall of Pharmacy, hospital, Missionary Training Building. The tuition fees are small, and the institution is supported partially by the American Baptist Home Mission Society. The university occupies a leading place in the work of the education of the colored race, and has won the respect of the southern people. It is unable to meet the demands made upon it, and is obliged

to refuse admission to many students. The students number 500, the faculty 45.

SHAYS'S REBEL'LION, *shāz'ĕs:* uprising in western Mass. 1786-7, named from Daniel Shays, who had served at Bunker Hill and been a captain in the revolutionary war. There had been a growing discontent in the state since 1782, with outbreaks in some countries against the courts. It was claimed that taxes were too severe, the lawyers extortionate, and the senate aristocratic; and the malcontents demanded the issue of paper money, and the removal of the general court from Boston. Shays appeared as their leader first at the head of 1,000 men, who attempted to prevent the session of the supreme court at Springfield, and at the head of a similar outbreak at Worcester, 1786, Dec. The following month an attempt was made to capture the arsenal at Springfield. The militia had warning of Shays's approach, and he was repulsed, with three men killed. The insurgents retreated through South Hadley, and were overtaken two miles beyond Petersham, 150 taken prisoners, and the rest dispersed. Some of the leaders were sentenced to be hanged, but were afterward pardoned. Shays sought refuge in Vermont for a year, but was then pardoned at his own request, and removed to Sparta, N. Y., where he died.

SHE, pron. *shē* [AS. *seo*, fem. of *se*, used as def. article: Ger. *sie;* Skr. *sa*, she]: the nom. fem. of the pron. of the third person, applied to females only, or things personified in the fem.; as a prefix—a female, as she-bear: N. in *OE.*, a woman, usually with some degree of humor or contempt.

SHEA, n. *shē'ă* [a native name]: tree of tropical Asia and Africa, from whose nut a sort of butter or solid oil is obtained; the butter obtained from the *Bassĭa Parkĭī*, ord. *Sapotācĕæ*. See BASSIA.

SHEA, *shā*, JOHN GILMARY, LL.D.: R. C. historian: 1824, July 22—1892, Feb. 22; b. New York; son of the principal of Columbia College Grammar School, where he was educated, afterward studying law. He was editor of the *Hist. Mag.* 1859-65; first president of the Roman Catholic Historical Society of the United States; and has published very numerous works, among which are: *Discovery and Exploration of the Mississippi Valley* (1853); *Hist. of the Cath. Missions among the Indian Tribes* (1854); *Early Voyages up and down the Mississippi* (1862); *Novum Belgium* (1862—New Netherlands in 1643-4); *Hist. and Description of New France* (1866-72, 6 vols.); *Life of Pius IX.* (1875); *Hennepin's Description of Louisiana* (1880); *Le Clercq's Establishment of the Faith* (1881); *Penalosa's Expedition* (1882); *Cath. Church in Colonial Days* (1886); *Cath. Hierarchy in the United States* (1886); *Life and Times of Archbishop Carroll* (1888); also translated De Courey's work on the Amer. Rom. Cath. Church; and edited the Cramoisy series

of documents relating to French-Amer. colonies, and other works. Besides these are 15 vols. of grammars and dictionaries of Indian languages, many school-books, revisions of Rom. Cath. Bibles and prayer-books, etc. His last work, 1891, Oct., is *Father Junipero Serra,* 1713—1784, *and the Franciscan Missions in California.*

SHEADING, n. *shēd'ĭng* [AS. *sceadan;* Goth. *skaidan,* to separate, to divide]: one of the six divisions or districts of the Isle of Man.

SHEAF, n. *shēf,* plu. SHEAVES, *shēvz* [Dut. *schoof;* Icel. *skauf;* Ger. *schaub,* a bundle of straw: Gael. *sguab;* W. *ysgub,* a sheaf of corn]: a quantity of grain in the stalk tied together in a bundle after it is cut in the field; any bundle or collection, as a *sheaf* of arrows: V. to collect and bind in sheaves. SHEAF'ING, imp. SHEAFED, pp. *shēft.* SHEAFY, a. *shēf'ĭ,* resembling, or consisting of, sheaves. SHEAVED, a. *shēvd,* in *OE.,* made of straw.

SHEAL, v. *shēl* [Ger. *schale,* a shell (see SHELL)]: in *Scot.,* and *OE.,* to separate the parts; to shell: N. a husk; a pod. SHEALED, a. *shēld,* shelled. SHEAL'INGS, n. plu. *-ĭngz,* the outer husks; pods or shells.

SHEAL, n. *shēl,* or SHEALING, n. *shēl'ĭng* [Icel. *skjol,* shelter; *skyla,* to screen, to shelter: Gael. *sgàille,* shade]: a hut for shepherds, fishers, etc.; a shed for sheltering sheep; also spelled SHEEL, SHEIL, SHIEL, and SHIELING.

SHEAR, v. *shēr* [Ger. *scheren,* to shear, to clip: Dut. *scheren,* to tear: Icel. *skera;* Dan. *skære;* Scot. *shear,* to cut, to reap corn (see SHARE)]: to cut or clip from a surface with shears or scissors, as wool from sheep, or the nap upon cloth; to fleece; in *Scot.,* to reap, as corn. SHEAR'ING, imp.: N. the act or operation of clipping or shearing by shears or by a machine. SHEARED, pt. *shērd,* or SHORE, pt. *shōr,* did shear. SHEARED, or SHORN, pp. *shōrn.* SHEAR'ER, n. *-ėr,* one who shears. SHEAR'LING, n. *-lĭng,* a sheep only once sheared. SHEAR'MAN, n. one whose occupation is to dress or shear cloth. SHEARS, n. plu. *shērz* [AS. *sceara;* Ger. *schere,* shears]: cutting instrument of two blades which move on a pivot and act against each other: in gardening, they are scissors on a large scale, variously modified for various purposes, e.g., pruning trees, hedges, box-edgings, verges of grass-plots, etc. They are often furnished with long wooden handles, and a spring is sometimes fixed between the handles. A kind used for removing small branches of fruit-trees has one blade made to slide along the other while they are brought together, so that it makes a cut as clean and smooth as that of a knife.—The name is given to anything in the form of shears, or which acts as shears; also two or more long pieces of timber whose ends are fastened together at the top, but spread at the bottom, used when furnished with tackling to raise heavy weights; in *OE.,* wings. SHEAR'BILL, a certain fowl, called the black-skimmer or cut-water. SHEAR-STEEL, a kind of steel made

of welded bars drawn out and tempered (see IRON). SHEARING MACHINE, machine used in preparation of woven woolen fabrics (see WOOLEN MANUFACTURE).

SHEARD, n. *shērd* [for SHARD, which see]: in *OE.*, a fragment, as of earthenware.

SHEARD, *shērd*, T. F. M.: English painter: b. Oxford, 1866, Dec. 16. After his graduation in 1889 he went to Paris and studied painting under Courtois, Rixens, Lefèbre and Rigolot. He has since then exhibited at the Salon, Royal Academy, and the Royal Institute of Water Color Painters. He was awarded a bronze medal at the Paris Exhibition of 1900. He is fond of eastern subjects, and scenery flooded with sunlight, and among his paintings of this character are *A Market Morning in a City of the Sahara; An Arab Blacksmith;* etc. Among his scenes of English peasant life may be mentioned *Birds of a Feather; The Outcast; Parted;* etc.

SHEARMAN, *shēr'man*, THOMAS GASKELL: American lawyer: b. Birmingham, England, 1834, Nov. 25; d. Brooklyn, 1900, Sept. 29. At nine he came to America with his parents and in 1857 took up his residence in Brooklyn. He was admitted to the bar in 1859, and in 1868 formed a partnership with David Dudley Field. Later John W. Stirling entered the firm which was continued after 1873 by Shearman and Stirling. This firm defended Jay Gould in suits resulting from the gold panic of 1869, and Henry Ward Beecher in the suit brought against him by Theodore Tilton. Shearman was an advocate of absolute free trade and a vigorous propagandist of Henry George's single tax theories. From early years he contributed to legal literature, and was joint author of *Tillinghast and Shearman's Practice, Pleadings and Forms* (1861-5), and *Shearman and Redfield on Negligence* (1869). He prepared for the commissioners of the New York code, the *Book of Forms* (1861), and the major part of the civil code relating to obligations (1865). He also published *Talks on Free Trade* (1881); *Pauper Labor of Europe* (1885); *Distribution of Wealth* (1887); *Owners of the United States* (1889); *The Coming Billionaire* (1890); *Crooked Taxation* (1891).

SHEAR'WATER (*Puffinus*): genus of *Procellaridæ* (see PETREL), differing from petrels in having the tip of the lower mandible curved downward, and the nostrils opening separately and not by a common tube. The bill is as long as the head, or longer, the upper mandible compressed and curved at the point. The legs are of moderate length, the tarsi compressed; the hind-toe is rudimentary. The wings are long and pointed. The shearwaters spend their lives mostly on the ocean, rarely visiting the shore except for incubation.—The GREATER, WANDERING, or CINEREOUS SHEARWATER (*P. cinereus* or *major*) is about 20 inches long, the upper parts brownish ash; the throat, breast, and belly gray: the young are entirely

brown, the upper parts darkest. This species is frequently seen on the coasts of Europe, and from Newfoundland to Florida.—The MANX SHEARWATER (*P. Anglorum*) is common on the Orkney and other northern islands, and frequents the American coast from Labrador to New Jersey: it is about 15 inches long, black, the neck mottled with gray, throat and all the under-parts white. It breeds on islets, in rabbit-burrows, or in crevices of the rocks.—There are several other species in warmer climates.—The name Shearwater is sometimes given also to the Skimmers.

SHEATH, n. *shēth* [AS. *scæth;* Ger. *scheide;* Dan. *skede;* Icel. *skeidir,* a sheath: Sw. *skida,* a shell]: a case for a sword or like instrument; a scabbard; the wing-case of an insect; in *bot.,* a petiole when it embraces the branch from which it springs, as in grasses. SHEATHE, v. *shēth,* to put into a scabbard or case; to protect with any exterior covering or membrane; to cover with sheets of copper, etc., as a ship's bottom. SHEATH'ING, imp.: N. the casing or covering of a ship's bottom (see below). SHEATHED, pp. *shēthd.* SHEATHER, n. *shēth'ėr,* one who sheathes. SHEATHY, a. *shēth'ĭ,* forming a sheath or case. SHEATH'LESS, a. *-lĕs,* without a case or covering. SHEATH-WINGED, a. *wĭngd,* having cases for covering the wings, like the beetle.

SHEATH'-BILL (*Chionis*): genus of birds of family *Chionidæ,* placed by many naturalists among the *Grallæ,* but by others regarded as belonging to the *Gallinaceous* order, and ranked by Swainson among *Columbidæ.* The legs are stout and moderately long; the toes much resemble those of the common fowl, but the fore-toes are united at the base. The bill is thick and conical, and the base is covered by a horny sheath, which the bird has the power of raising and depressing. The WHITE SHEATH-BILL (*C. alba*) inhabits the shores of Australia, New Zealand, and neighboring islands, and feeds on mollusks, crustaceans, and whatever animal substance is thrown up by the waves. It is about the size of a partridge, white, with bill and wrists black.

SHEATH'ING: protection for the wooden planking of the immersed portion of a ship from the attacks of the teredo and other worms, mollusks, and marine animals, which, especially in hot climates, adhere to the bottom and eat into the timber, and retard the vessel's progress. As early as the time of Trajan, sheets of lead were used as sheathing. Thin deal boards, about half an inch thick, were in more modern times nailed on and frequently changed; but about the beginning of the 19th c. plates of copper were introduced, which have been found effectual, though expensive. The gradual oxidation of the copper by the action of the sea-water produces a sort of poison, which prevents any marine animal from adhering, and keeps a clean bottom. The copper, however, slowly wears

away in this oxidation, and requires renewing after a few years. To prevent this loss, various methods have been devised. Sir H. Davy applied what he called protectors, consisting of pieces of iron and zinc on different parts of the *copper;* the action of the water on the two metals produced a small galvanic current, which prevented the copper from oxidizing; but it became forthwith incased in barnacles and weeds. For ships stationary in harbor, as hulks, ships-in-ordinary, etc., this system of protection suffices; but it fails for sea-going vessels, together with many other protecting mixtures which have been tried, from the fact that, in proportion as the copper is saved from oxidation, by so much does it cease to repel the incrustations which always threaten it.

SHEAVE, n. *shēv* [Dut. *schijf,* a disk, a wheel: Low Ger. *schive,* anything round and flat: Ger. *scheibe,* a wheel or pulley: Icel. *skifa;* Dan. *skive,* a slice, a sheave: Icel. *skifa,* to split, to cleave (see SHIVER)]: wheel or circular disk on which the rope works in a block (see PULLEY). SHEAVE-HOLE, a channel cut in a mast, a yard, etc., in which to fix a sheave.

SHEAVED, a. *shēvd* [from SHEAF, which see]: in *OE.,* made of straw. SHEAVES, n. plu. *shēvz:* see SHEAF.

SHE'BA. See SABEANS (dwellers in Yemen).

SHEBEEN, n. *shĕ-bēn'* [Irish]: a place where spirits and other excisable liquors are illegally and privately sold. SHEBEEN'ING, n. the practice of keeping a shebeen.

SHEBOYGAN, *shē-boi'gan:* Wis., city, county-seat of Sheboygan co.; on Lake Michigan at the mouth of Sheboygan river, and on the Chicago & Northwestern railroad; about 50 m. n. of Milwaukee and 100 m., in direct line, n.e. of Madison. It has a good harbor and steamer connections with the principal lake ports. A regular line of steamers ply between the city and Milwaukee and Chicago during the navigation season. The first settlement was made in 1836; the place was incorporated as a village in 1846, and in 1853 was chartered as a city. Sheboygan is the commercial and industrial center for a large and fertile agricultural region. The chief industrial establishments are five chair factories, in which there are over 2,000 employees; 11 furniture factories, foundry, boot and shoe factories, a shipyard, lime kilns, brick works, machine shops, enameled ware works, tanneries, carriage factories, planing mills, boiler works, and soap factory. It has large warehouses, five for cheese alone. The government census for 1900 gives as the number of manufacturing establishments 206, and the number of employees in the same 5,540. The amount of capital invested, $7,766,616; annual amount paid for wages, $1,928,167; for raw material, $3,995,102; and the value of the product, $7,469,202. The chair factories, for which Sheboygan is noted, turn out about 7,000 chairs each day; and the value of the annual output from the furniture factories

is over $3,000,000. The principal public buildings are a government building, county court-house, municipal buildings, the churches and schools. There are two parks; in one, Fountain Park, is an artesian well, the waters of which contain considerable mineral salts and are of commercial value to the city. There are 20 churches, an asylum for the chronic insane, a Home for the Friendless, and Saint Nicholas Hospital. The educational institutions are a day school for the deaf, a high school, public and parish elementary schools, a public school library containing about 5,000 volumes. The two state banks have a combined capital of $300,000. The growth of the city has been rapid; but business men have been attracted to the place as one in which manufacturing industries have been most successful. Pop. (1900) 22,962.

SHE'CHEM, or SI'CHEM, or SY'CHAR. See NABULUS, or NABLUS.

SHECHINAH, or SHEKINAH, *shē-kī'nâ* [Heb.—from *shachan,* to reside, rest]: a word used in post-biblical times by the Jews, and adopted by early Christian writers: expressive of the visible symbol of the Divine Presence, in Heaven, or among the people of Israel, or in the Sanctuary, where, as a cloud of glory or suffused light, it rested over the mercy-seat. The word is found first in the Chaldee versions (Targums) as a kind of periphrasis for the person of God, wherever it is mentioned in the Bible as corporeal: thus being a kind of spiritual interpretation of anthropomorphism. The Shechinah is not supposed to have dwelt in the second temple, but it is to return with the Messiah. The first mention of the word is in the Targum Jerushalmi, Gen. iii. 24—'And he expelled Adam, and caused to reside the splendor of his Shechinah from the beginning at the east of the garden of Eden, above the two cherubim.' (Second recension: 'between the two cherubim.') Another characteristic instance of its use is found in the version of Onkelos, Deut. iii. 24—'Thou art God, Thy divine Shechinah is in Heaven above, and rules on earth below.'

SHED, n. *shĕd* [Dut. *schutten,* to ward off, to hedge: Norw. *skuta,* to project; *skut,* a shed formed by the projecting roof of a house: Icel. *skuti,* shelter given by a projecting rock]: a temporary building of wood for shade or shelter; a hut; a hovel; a penthouse or shelter of boards.

SHED, v. *shĕd* [Low Ger. *schudden,* to shake: Bav. *schütten,* to shake, to spill: Gr. *skedannumi,* I scatter]: to pour out; to spill; to let fall; to scatter; to diffuse; to throw off, as a natural covering. SHED'DING, imp.: N. act of scattering; that which is cast off or out. SHED, pp. *shĕd.* SHED'DER, n. *-dĕr,* one who or that which sheds or spills.

SHED, v. *shĕd* [Ger. *scheiden;* Goth. *skaidan;* AS. *sceadan,* to separate, to divide]: in *prov. Eng.* and *Scot.,* to

divide or part the hair, generally along the crown; in *Scot.*, to separate or part the lambs from their dam: N. the natural flow of waters, separating hither and thither, from the high lands to the lower, as in water-*shed*. SHED'DING, imp.: N. the parting of the hair. SHED, pt. pp.

SHEDD, *shĕd*, WILLIAM GREENOUGH THAYER, D.D., LL.D.: 1820, June 21—1894, Nov. 17: theologian; b. Acton, Mass. He graduated at the University of Vermont 1839, and at the Auburn Theological Seminary 1843. In 1844 he became pastor of the Congregational church in Brandon, Vt.; 1845 professor of English literature in the University of Vermont; 1852 professor of sacred literature in the Auburn Theological Seminary; 1853 professor of ecclesiastical history and lecturer on pastoral theology in Andover Theological Seminary. In 1862 he became associate pastor of the Brick (Presb.) Church, New York; 1863 professor of biblical literature in Union Theological Seminary, New York; 1874 was transferred to the chair of systematic theology, which position he retained until 1890, when he became professor emeritus in this seminary. He had published a translation from the German of Theremin, *Eloquence a Virtue* (1850; 2d ed. 1859); and of Guericke's *Manual of Church History*, 2 vols. (1860-70); and is the author of *A History of Christian Doctrine*, 2 vols. (1865; 8th ed. 1884); *Homiletics and Pastoral Theology* (1867; 8th ed. 1884); *Sermons to the Natural Man* (1871; 3d ed. 1884); *Theological Essays* (1877); *Literary Essays* (1878); *Commentary on Romans* (1879); *Sermons to the Spiritual Man* (1884); *The Doctrine of Endless Punishment* (1886). Dr. Shedd's *History of Christian Doctrine* has gained very high repute for learned research, logical force, and felicitous expression, though his position is that of a strong upholder of a rigid type of Calvinism.

SHEE'DY, MORGAN M.: American Roman Catholic clergyman: b. Ireland 1853, Oct. 8. He was ordained priest in 1876. He was the first president of the Catholic Summer School, and is editor and publisher of the *Church Quarterly*. He has been rector of Saint John's Church, Altoona, Pa., since 1894, and has published *Christian Unity* (1895); *Social Problems* (1896); *Briefs for Our Times* (1906).

SHEEL, n. *shēl*, and SHEEL'ING, n. See SHEAL 2.

SHEEN, n. *shēn* [AS. *scyne*, bright, clear: Dut. *schoon;* Ger. *schön*, beautiful]: brightness; splendor: ADJ. in *OE.*, bright; glittering; showy. SHEENY, a. *shēn'ĭ*, bright; shining.

SHEENY, n. *shēn'ĭ: colloq.* [etymology doubtful; possibly from Fr. *chien*, dog, originating in the days of the Norman persecution of the Jews in England]: a slang and opprobrious term applied to Jews; sharp fellow looking out for some one whom he can cheat, or with whom he may make a sharp bargain.

SHEEP, n. *shēp* [Dut. *schaap;* Ger. *schaf*, sheep: Bohem. *skopec;* Pol. *skop*, a wether or castrated sheep—from Pol. *skopiti*, to castrate]: domestic ruminant quadruped, covered with wool (see below): *familiarly*, one who is foolishly modest and backward: in *Scrip.*, a term applied to God's people, indicating their relation to Christ the Good Shepherd. SHEEP'ISH, a. *-ĭsh*, very bashful; overmodest; meanly diffident. SHEEP'ISHNESS, n. *-nĕs*, the quality of being sheepish; excessive modesty or diffidence. SHEEP'ISHLY, ad. *-lĭ*. SHEEP'S-BIT, a blue flower, the *Jasionĕ montāna*, ord. *Campanulācĕæ*. SHEEPCOTE, a small inclosure or pen for sheep. SHEEP-DOG, a valuable variety of dog, trained to watch and turn sheep; a collie. SHEEP'S-EYE, a diffident loving look. TO CAST SHEEP'S EYES, to look furtively, as a bashful lover does at the object of his affection. SHEEP-FOLD, a place where sheep are confined. SHEEP SHANK, among *sailors*, a peculiar knot made to shorten a rope. SHEEP-SHEARER, one who shears sheep. SHEEP-SHEARING, the act of shearing sheep. SHEEPSKIN, the skin of a sheep, or the leather prepared from it. SHEEP'S SORREL, a herb, growing naturally on a poor gravelly soil. SHEEP-STEALING, in *English law*, a felony; in *Scotch law*, a capital offense, though for some time the death-penalty has not been inflicted. SHEEP-TICK, an insect which infests sheep (see SHEEP). SHEEP-WALK, a place where sheep feed. CLAD-SHEEP, sheep with their full fleece upon them ready for shearing. *Note.*—The *ram* or *tup* is the male or sire: the *ewe*, the female or dam; the *lamb*, the young sheep; the *hogget*, a weaned lamb; a *wether* or *wether-hogget* is a castrated male or tup; after the first fleece is shorn, the male is a *shearling*, the female a *gimmer*, and the wether a *dinmont*.

SHEEP (*Ovis*): genus of quadrupeds, ruminant, with hollow horns, of family *Capridæ*, and very closely allied to the goat. It varies from the latter in being larger, in having a more convex face and spiral horns (the latter lacking in many domestic breeds), in being without a beard, and in various other characteristics. It is more timid than the goat, and has changed more under domestication. It is quite strong and climbs steep hills, and even rugged mountains, with facility. Its legs are small; its hair is of two kinds, one of which, the inner and softer, is known as wool (see WOOL) and in the domestic S. forms the principal covering; and its hoofs are horny and separated like those of the ox. It has 12 molar teeth in each jaw, and 8 incisors in the under, but none in the upper jaw. Except the outer incisor on each side, which appears in the fourth year but does not become fully developed for several months, the S. has all its permanent teeth when three years old. By some naturalists the genus is divided into 21 species, but a few classify these species under four genera. In the wild state S. are widely distributed, and the domestic S. is found in almost all regions inhabited by man.

There are several wild species. Of these the musimon (*O. Musimon*) is found in Corsica, Sardinia, and mountainous regions of European Turkey. It is, like other wild spe-

cies, apparently intermediate between the S. and the goat, but breeds with the domestic S., and considerable numbers have been domesticated. Somewhat resembling this is the argali (*O. Ammon*), found wild in the mountains and on the elevated plains of central and n. Asia. These S. are readily domesticated and are esteemed for their flesh and their skins. The African argali (*O. Tragelaphus*) is a large and bearded S., found in the more elevated regions of n. Africa. (See ARGALI.) The Rocky Mountain S. (*O. Montana*) is found in small flocks in the n.w. United States, on the most craggy parts of the Rocky Mts. From the enormous size of its horns it is often called the Bighorn sheep. Its flesh is of the very finest. From which, if either, of the existing wild breeds the domestic S. is descended is unknown. See MOUFFLON.

Rocky Mountain Sheep.

All the wild sheep known are natives either of mountainous regions or of dry and elevated tablelands. They are gregarious, a character which the domesticated sheep fully retains. They are seen usually in small flocks, and are not easily approached, taking refuge in flight, a sharp whistling sound, emitted by one of the rams, serving as an alarm to the whole flock; though they are capable of making a vigorous defense when driven to close combat. A ram of the domestic species is, indeed, able to sustain a conflict with a bull, taking advantage of his far greater agility, and butting against his foe with his strongly armed forehead. Many rams show great pugnacity. Sheep differ from goats in their mode of fighting. Goats rear themselves on their hind-legs, and throw themselves sideways on their adversary, to bring the points of their horns to bear. Sheep rush straight at each other, a mode which better suits the different style of armature of the head. Rams of the black-faced variety are especially powerful with their heads, and often at the rutting season kill each other. Their naturally strong skull is considerably protected in battle by heavy

arched horns Ewes of this breed also fight. Sheep without horns are not so pugnacious as the mountain breeds.

All the wild sheep have short wool, with an outer clothing of long and nearly straight hair. But even the long hair—at least on the Moufflon—has the peculiar character of wool, in that roughness of surface which gives it the property of *felting* (see HAIR and FELT). One effect of domestication in the common sheep has been to cause the disappearance of the outer long hair, and to produce instead an increase of the length and abundance of the wool, an object of great importance to the sheep farmer. In neglected breeds of the common sheep, the two kinds of hair or wool are very apparent In some tropical climates, the sheep loses its abundant fleece, and is covered with hair little longer than that of the ox.

Although not equal to goats in adaptation to rocky steeps, and without such power of leaping from crag to crag, most breeds of sheep tend to seek their food in places where no animal not agile and surefooted would venture; and those of the domesticated breeds which retain much of their original wildness are thus adapted to situations in which otherwise the pasture would be of little value to man. One who has seen the lambs frisking on a Highland hill, in a fine evening, must have admired their nimble movements in places where a herd-boy could with difficulty scramble. In fine weather, sheep ascend the heights; and in cold and stormy weather, they repair to the lower grounds In modern times it has been customary to remove the large flocks from mountainous regions to lower grounds to pass the winter; and in the fall of the year, shepherds have difficulty in preventing the animals from leaving the summer pastures too early if the weather is unfavorable. On the other hand, if fine spring weather sets in before the period of removal from the winter quarters, the flocks keep pressing toward the summering regions. Mountain sheep have favored spots whither they go regularly over-night, and the ewes generally have choice localities to which they go to lamb. Sheep grow attached to certain pastures, and they have been known to return stealthily, in the course of a few days, to their native or appreciated pastures, though removed hundreds of miles.

The Common Sheep (*O. aries*) was probably the first animal domesticated by man. Sheep formed a large proportion of the property of the patriarchs, some of whom had immense flocks; and many noted men of ancient times were shepherds. Ancient writers, sacred and profane, made frequent references to S. and to their use in religious sacrifices and festivals. With increase of civilization the keeping of S. has been widely extended, and as agriculture has improved, the value of these animals has become more apparent. The Spaniards have an old proverb that 'The hoof of the sheep is golden,' and long ago sheep husbandry was pronounced by observing writers the 'sheet-anchor of English agriculture.' So highly were S. valued about the time of Queen Elizabeth that stringent laws were passed to prevent their exportation, which had previously been

allowed. Any one convicted of sending S. out of the country was for the first offense, condemned 'to forfeit his goods forever, to suffer a year's imprisonment, and then have his left hand cut off in a market-town on market-day, there to be nailed up to the pillory.' For a repetition of the offense it was ordered that 'he should be adjudged a felon and suffer death.' There were also, at various times, restrictions on export of wool.

Those who watch sheep carefully, or keep them as pets, find them not devoid of intelligence. They have, however, a stupid habit of following, without scruple, the leader of the flock; so that, when sheep are being driven across a narrow bridge, or where a fence separates the road from a precipice, if anything occur to deter them from proceeding in the proper path, and one break over the fence or parapet, more of the flock may be expected to follow, as has sometimes happened, to their utter destruction. Sheep soon come to know the voice of the shepherd, also the appearance and the bark of the shepherd's dog.

The S. matures at an early age, and makes quick return for the capital invested—a quality which has often been pushed to an extreme. The ewe should not drop her first lamb till she is about two years old, and in the late-maturing breeds not till she is three years old. The period of gestation is about 21 weeks. The ewe brings forth one, frequently two, rarely three, lambs at a birth. Although, if well cared for, they live to a greater age, S. should not be kept for breeding purposes after they are 8 or 9 years old; and unless they are exceptionally valuable, it is not profitable to keep them for any purpose until they reach this age. If the best results are to be obtained, the males must be of pure blood. The better the breeding of the ewes, and the more careful their selection in respect to size, constitutional vigor, symmetry of form, and quantity and quality of wool, the higher will be the standard which the flock will attain. The use of grade rams, the indiscriminate crossing of pure breeds, or breeding from stock in any wise inferior, will surely and rapidly cause deterioration in the character of the flock. But a proper selection of the stock, and a careful attention to the principles of breeding, will, with equal certainty, secure and maintain excellence. The ewes should be kept tame, so that they can be easily handled, but the rams should never be either teased or petted, as either course will be sure to make them cross and dangerous.

S. naturally prefer uplands, but can be kept without difficulty in drained lowland meadows or pastures. Wet, marshy soils are decidedly unfavorable. S. will eat not only the finer grasses, but will also crop much of the coarser herbage of the fields in which they are confined. When the quantity of grass is limited, they will eat also many weeds and briers, and they are sometimes kept largely with a view to eradication of these pests. But the better the pastures, the more rapid and uniform will be the gain which the flock will make. The same principle holds in winter feeding. Rowen hay is much better, especially for

breeding ewes and lambs, than that of the first crop, and fine hay for them is much superior to the coarser kinds. The addition of from a gill to a pint of corn or oats per day, or its equivalent in oil-meal or Indian meal, will be highly beneficial. Turnips, beets, or carrots also have important place among the materials for winter feeding. All marked changes in the kinds of food given to S. should be made gradually, and a liberal standard, both as to quantity and quality, should be constantly maintained. Variations from high to scant feeding, or the reverse, will not only be injurious to the animals, but will cause irregularity in the fibre of the wool, which will seriously injure it for manufacturing purposes. An abundant supply of pure water should be provided, and protection should be given from storms and extremes of temperature.

In very early times, S. were kept for their milk and skins. In some countries the milk is used at the present day, and is even made into cheese; but the wool and flesh are the principal items for which, in most regions, S. are now maintained. An incidental, though very important, advantage is found in the improvement of the land where S. are skilfully managed.

In the great number of breeds which have been formed, there are some which have very peculiar features. The Fezzan S., found in Africa, have short and curly wool, which appears like a mane on the neck; the Caraman S., in Asia and Africa, have enormous tails, heavily loaded with fat; the Fat-rumped S. of Tartary have small tails, which are often covered by masses of fat on the rump; and the Wallachian S. of Hungary have long and nearly upright, twisted horns, and soft wool covered by long hair.

The efforts often made to combine in a single breed the highest excellences in production of both wool and mutton have not been successful. The classes of S. yielding the finest wool do not give the best meat, and no distinctively mutton breed has yet been formed which supplied the most desirable kind of fleece for manufacture into the finer fabrics. Careful breeding has greatly improved S. along the line of their predominant qualities. The quantity and quality of the fleece of the wool-producing breeds have been increased and improved, the weight of the carcass and the quality of meat of the mutton breeds have undergone equally great change, and both classes are now matured at much earlier age than formerly. But the effort to combine the highest quality of wool and the best quality of flesh results in only a medium degree of excellence along either line.

In the United States, breeds of S. are usually classed, according to the character of the fleece, into fine-wooled, middle-wooled, and coarse-wooled. Of the first, the Merino is the best type. It is one of the oldest and most widely disseminated breeds of S., was known in Spain before the Christian era, and has been brought to high perfection. When small, the lambs are rather tender, but the sheep are hardy and long-lived. They are of

medium size, not very prolific, mature slowly; can be kept on rather scant pastures, but amply repay generous feeding; yield large fleeces of fine and soft wool, but are not equal to some other breeds for production of mutton. By far the larger proportion of the S. in the United States have more or less Merino blood in their veins. Differences in care, food, and climate have made marked variations in the appearance of S. of this breed in different parts of the country.

Among the middle-wooled—sometimes called the British short-wooled—breeds, one of the most popular in this country is the Southdown, an old English breed, which during the past century and a half has been greatly improved. S. of this breed mature early, are hardy and prolific, grow to good size, are nicely formed, have brown faces and legs, are excellent for mutton, and yield moderately heavy fleeces of rather fine wool. They thrive under widely differing conditions. Where only one breed can be kept to supply both mutton and wool, this is one of the most desirable, and is by many sheep-owners considered the best. There are other branches of the family, as the Shropshire, Hampshire, and Oxford Downs—valuable breeds, varying from the Southdown in only minor particulars.

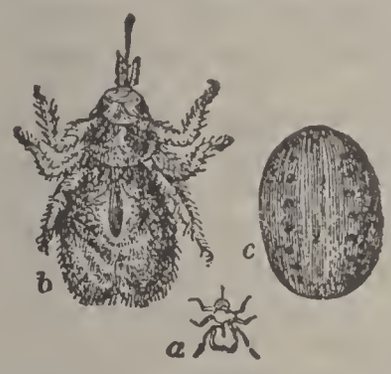
One of the oldest and most popular breeds of coarse-wooled S. in England, and the most largely kept in the United States, is the Cotswold. These S. are very large, hardy, prolific, have white faces and legs, fatten readily, and yield a large quantity of long and rather coarse wool, which is in demand for combing purposes. The Leicester and Lincoln breeds, popular in England, and to some extent here, closely resemble the Cotswold.

There are many other breeds, some with only local reputation, others widely known. There is no breed of domesticated S. indigenous to this country. The very few breeds originated here have proved of little value and have been allowed to become extinct. What are known as native S. do not belong to any distinct breed, but are the result of mixtures of the blood of various imported breeds.

The S. is subject to a number of diseases. Of these, some can be easily prevented; and, with a few exceptions, the others yield to prompt and skilful treatment. (See Foot-rot: Grub: Rot.) Catarrh sometimes causes heavy losses. It is due to exposure, and can be almost entirely prevented by giving the animals suitable protection. One of the most efficient remedial measures is occasional smearing of the noses of the affected animals with tar. In addition to this, a mixture of one part of sulphur to five parts of salt, placed where the S. can have constant access to it, is sometimes supplied with good effect. The Scab, a contagious and virulent disease, is caused by a minute insect which burrows in the skin, multiplies rapidly, causes intense itching, the formation of scabs, and the loss of wool, spreads from the affected centres, and, if not checked, results in death. Flocks

which are properly fed, have abundance of pure water and pure air, and are protected from extremes of temperature, are not likely to contract this disease except by contagion. On its first appearance the affected animals should be isolated, and placed under treatment for destruction of the parasites. Dipping the animal in a strong decoction of tobacco is a common remedy. To this some owners add soap and sulphur, or a small quantity of blue vitriol. The application should be repeated in ten days, and in severe cases a third dipping may be required. If the disease has made much progress, the scabs should be softened, by rubbing with lard and washing with soap-suds, before the other remedy is applied. Arsenic, mercurial ointments, and various alkalies are sometimes used. Some of these are objectionable on account of their poisonous qualities, and others because of injury to the wool. There are some patent preparations said to be safe and efficient, as well as very convenient to use. Whatever course is adopted, the treatment should be careful and thorough. The interior of the pens in which affected sheep have been kept should be washed with a strong decoction of tobacco, the bedding should be burned, and the pastures which they have occupied should not be used for three months.

The Sheep-tick, known also as sheep-pest and sheep-louse, is a parasite which causes great suffering to the animals and a corresponding loss to their owners. It harbors in the wool, multiplies rapidly, and sucks the blood of the S. on which it finds its home. Infected animals are poor in flesh; their wool is injured in quality by the constant drain on the system, and is often loosened from the skin; and they cannot be made to thrive till the parasites are removed. Ticks are common on neglected S., and frequently appear on the best-kept animals. If there are lambs in the flock, the ticks leave the S. soon after they are sheared, and find refuge in the longer wool of the lambs. Dipping in a decoction of tobacco or in one of the patent preparations for the purpose will exterminate the pests. Some flock-masters dip both S. and lambs at shearing-time. Others prefer to wait till the ticks have left the S., and dip only the lambs.



Sheep-tick (*Melophagus ovinus*): *a*, natural size; *b*, magnified; *c*, the pupa, magnified.

The first domestic S. in this country were brought from England to Jamestown, Va., 1609, and about 15 years later some were brought to N. Y. and Mass. The first importation of Merino S. was 1793, when three fine animals were landed in Boston, and given to a friend of the importer, who promptly converted them into mutton. In 1801 a few S. of this breed were brought from Spain and France, and the following year about 100 head were

brought from Spain. Large numbers of sheep of the improved English breeds have been more recently imported.

Owing to the influence of wars, to changes in the tariff affecting the price of wool, and to various other causes, the sheep industry in the United States has been subject to great fluctuations. In many localities it is, and long has been, greatly depressed on account of the ravages of dogs. On the ranches of the west, where sheep are kept in immense numbers, heavy losses are frequently sustained through lack of winter protection. In 1850 the number of mature sheep in the United States was 24,000,000, the leading states being New York and Ohio. Until 1860 the number remained stationary, but at the 1870 census it had increased to 28,471,275. In 1880 it reached 42,876,312, and has remained about 40,000,000 since, the 1900 census showing 31,919,298 ewes and 8,018,275 rams and wethers. The lamb crop is, generally speaking, about two-thirds the number of ewes; in 1900 the number of lambs dropped and reared to June 1, or sold fat, per 1,000 ewes, was 689, being highest in the North Atlantic States with 758, closely followed by the South Atlantic States with 730, North Central with 716, and lowest in Hawaii with 284. In 1889 the census showed that the number of sheep and lambs which died from exposure or were killed by dogs was equal to 25 per cent of the lamb crop. The total number of sheep and lambs on Jan. 1, 1904, was 51,630,144, valued at $2.59 per head, or $133,530,099. The total value the previous June was about $170,000,000.

SHEEP-LAUREL, or LAMB-KILL: the *Kalmia* or mountain-laurel, which is poisonous to lambs and other small animals.

SHEEP, MOUNTAIN: a general term for the wild sheep of the world, which collectively form a group of romantic interest, and scientific importance. Excepting their perpetual rivals, the wild goats and ibexes, they are, of all land animals, the boldest and most active rock climbers, and the most partial to mountain scenery. Wherever found, they inhabit the highest and most rugged and picturesque situations. Strange as it may appear, the haunts of the Rocky Mountain big-horn include not only our loftiest mountain ranges and many wild tracts of 'bad lands,' but also the rocky walls of the great abyss known as the Grand Cañon of the Colorado. It is not strange, therefore, that all big-game hunters who love grand scenery find great fascination in the chase of wild sheep. No man worthy of the name of sportsman ever kills a ewe, but the head of an old ram, adorned with massive circling horns, won by dangerous mountain climbing and fair stalking, is a trophy of which any man may justly be proud.

It seems highly probable that the first wild sheep were developed in south-central Asia, in the region of the Altai Mountains, western Mongolia. At all events, the

favorable conditions there obtaining have developed the great Siberian argali (*Ovis ammon*), whose enormous horns are a perpetual wonder to all who behold them. Nearby in the Siar Mountains is found the Siar mountain-sheep. A comparatively short distance southward in Tibet is the Marco Polo sheep (*Ovis poli*), characterized by the enormous spread of its horns. A pair of horns of *Ovis poli* owned by Lord Roberts has a spread between tips of 54½ in., and the longest horn measures 75 in. in length on the front curve. Southward of the range of the *Ovis poli*, in northern India, occurs the Punjab wild sheep, and the beautiful burrhel or blue sheep, both of them small species. Southwestward of Asia only two wild sheep are found, the small but handsomely colored mouflon of Corsica and Sardinia, and the large Barbary wild sheep or aoudad of the mountains of the Barbary states of n. Africa. Northward from the home of *Ovis ammon* we find the Kamchatkan sheep, a species with horns like our white sheep, but otherwise exhibiting a strong resemblance to our big-horn. Of North American mountain-sheep, there are three conspicuous and well marked types, and three offshoots.

North America contains a really fine series of mountain-sheep species almost covering the mountainous regions of Alaska, and extending down the Rocky Mountain system to the region of Lake Santa Maria (lat. 30°) in n. Mexico. In addition to this, a species known as Nelson's mountain sheep branches off in s.w. Nevada, extends through s. California, and on down the peninsula of Lower California for two-thirds of its length. Of North American mountain-sheep, there are three conspicuous and well marked types, and three offshoots. When diagrammed they stand as follows:

Types	Offshoots
Big-Horn (*Ovis canadensis*)	Nelson's Sheep (*Ovis nelsoni*) Mexican Sheep (*Ovis mexicanus*)
Black Sheep (*Ovis stonei*)	
White Sheep (*Ovis dalli*)	Fannin's Sheep (*Ovis fannini*).

The Rocky Mountain big-horn has been known since 1803, and is our most widely known species. All the others are of recent appearance, only the white sheep dating back as far as 1884. The range of the big-horn extends from lat. 55° and lon. 120° to San Francisco Mountain, Arizona. It embraces the whole main range of the Rockies between those points, and also includes the Fraser River country, one locality in northern Washington, two in eastern Oregon, the counties of Custer and Dawson in Montana, the Black Hills and Bighorn Mountains of Wyoming, four localities in Utah, and the Grand Cañon of the Colorado. This is the largest and heaviest species of our *Ovis*, and carries the most massive

horns. It reaches its maximum development in the main range of the Rocky Mountains in western Alberta. A large ram stands 40 in. in height at the shoulders, and weighs about 325 pounds. Horns that measure 16 in. in basal circumference may justly be called very large. The largest and longest on record measured 18½ in. in basal circumference, and 52½ in. in length on outer curve, but the genuineness of this pair of horns is now doubted. One of the largest pairs in existence measures 16½ in. in basal circumference, 40½ in. in length, and weighs 38 pounds. Apparently the horns of a mountain-sheep grow as long as the wearer survives in a healthy condition.

Wild sheep are not covered with wool as domestic sheep are. Next to the skin is a coat of fine woolly hair, which is for warmth; but through this grows a coat of long, coarse hairs, large in diameter, pithy within and easily broken. This does duty as a rain-coat, and it also gives the animal its distinctive color. In summer, or late spring, when the old pelage is shed, the new coat is only half an in. in length, and the wild sheep stands forth fully sheared by the hand of Nature. At that season, the skin is worthless as a trophy. Mountain-sheep are at their best in October, November and December, and should be hunted at no other time. The lambs are born in May, and usually there is but one at a birth. Owing to the practical impossibility of keeping mountain-sheep of any American species alive in captivity, anywhere east of the great plains until they reach full maturity, our members of the genus *Ovis* are but little known to the general public, and consequently are quite unappreciated at their true value.

The white mountain-sheep of Alaska was not introduced to the world until 1884. It inhabits nearly all the mountainous regions of Alaska except the Alaska Peninsula, the valley of the Kuskoquim and the lower valley of the Yukon. Until recently it has been quite abundant on the Kenai Peninsula and around the head of Cook Inlet. This animal is all over pure white, and its winter pelage is long and abundant. It is smaller than the bighorn, and its horns never exceed 15½ in. in circumference. Northward its range extends almost to the Arctic Ocean, and its southern limit is found at lat. 58°. In 1901, the New York Zoological Society sent a collector to Cook Inlet to capture newly-born lambs of this species, and bring them to New York, for acclimatization in the Zoological Park. Three lambs were captured, but they proved to be such delicate feeders that all died within a few days of their capture.

The black mountain-sheep was discovered in 1896 in northern British Columbia, and good representatives of this species are to be seen in the museums of New York, Chicago, and Washington. The size of the black sheep is the same as that of *Ovis dalli*. The species is characterized by the wide spread of its horns, and the very dark color of its pelage, all except the white of the rump-patch

and the abdomen. So far as known up to 1904, the range of this species is very circumscribed, for it has not been reported outside of a small area in northern British Columbia.

Fannin's mountain-sheep, often called the 'saddle-backed sheep,' was discovered on the Klondike River near Dawson City in 1900. It is an offshoot of the white sheep, and may possibly be the result of cross-breeding between that species and the black sheep. Its back, sides, and tail are bluish gray, and a brown band extends down the front of each leg; but all other parts of the animal are pure white. Its horns are like those of the white sheep. But little is known of the range of this species.

The Mexican sheep and Nelson's sheep are both offshoots of the big-horn. They are short-haired and large-horned, and their prevailing color is pale salmon gray.

Wherever they are not fully protected by law, all species of American mountain-sheep are being diligently sought for and killed, by hunters for sport, and by natives for food. The total number now remaining is very small, and it is impossible for the survivors to be protected too rigidly. The big-horn quickly learns the value of protection, and the herd in the Yellowstone Park is now so tame that it sometimes permits visitors to approach within thirty paces. It is a pleasure to add that this herd is rapidly increasing.

SHEEPS'HEAD (*Sargus ovis*, now named *Archosargus probatocephalus*): fish of family *Sparidæ*, plentiful in the latter part of summer on parts of the North American coast, and highly esteemed for the table. It sometimes attains a weight of 14 or 15 lbs. Nets are used, and many fish are often taken at a single haul, which are immediately packed in ice for the market. It is difficult to take the sheepshead with a line, as its cutting teeth snap the line asunder. The genus *Sargus* has cutting front teeth, and round teeth in the back of the mouth. *S. Rondeletii* inhabits the Mediterranean, and has been esteemed for the table from ancient times. The *Sargi* feed on shell-fish and the smaller crustaceans, which they easily crush with their round teeth; partly also on sea-weeds.

SHEEPS'HEAD BAY: post village in Kings co., N. Y.; on the Atlantic Ocean, 2 m. n.e. of Coney Island. It has a church, and many summer hotels, boarding-houses, and residences, but is best known as the locality of the racing-grounds of the Coney Island Jockey Club, laid out 1880, and largely patronized.

SHEEP'-TICK, or SHEEP'-LOUSE (*Melophagus ovinus*): insect of family *Hippoboscidæ;* not a Tick proper: see SHEEP: also TICK.

SHEER, a. *shēr* [Dan. *skær*, sheer, bright, pure: Goth. *skeirs*, clear: Icel. *skærr*, bright; *skirr*, clean]: quite; pure; separate from anything else; mere; downright; unmingled, as *sheer* nonsense.

SHEER, a. *shēr* [AS. *sceran*, to shear, to divide: Dut. and Ger. *scheren*, to cut: Dan. *skære;* Icel. *skera*, to cut (see also SHEAR)]: perpendicular; precipitous; straight up and down: N. the longitudinal curve which the line of a ship's deck or sides presents to the eye: V. among *seamen*, to deviate from the line of the proper course, as a ship when not well steered; to turn aside. SHEER'ING, imp. SHEERED, pp *shērd*. To SHEER OFF, to turn or move aside to a distance; to steal away. To SHEER UP, to turn and approach to a ship or place in nearly a parallel direction.

SHEERAZ': see SHIRAZ.

SHEERNESS, *shēr-nĕs':* seaport and naval arsenal in the county of Kent, England; on the n.w. extremity of the Isle of Sheppey, at the confluence of the Thames and Medway, 11 m. e.n.e. of Chatham. It consists of four divisions, Blue-Town, Mile-Town, Marine-Town, and Westminster; of these the first is within the limits of the garrison. The dockyard is one of the finest in Europe: it covers 60 acres, comprising wet and dry docks, immense storehouses, and official residences. The harbor is usually crowded with vessels. An extensive oyster-fishery is in the vicinity, from which as many as 50,000 bushels of 'natives' have been sent to London in one season. At Garrison Point is the residence of the port-admiral, the telegraph, coastguard station, and barracks. The chief trade is in supplying the requirements of the employees in the various govt. establishments, and in export of corn, seeds, and oysters. The neighborhood was once thought very unhealthful, but important sanitary works have been carried out, and there are now few towns which show a better health record. The town is much visited during the summer for the excellent sea-bathing. The beach and cliffs are a favorite resort for ramblers. S. was captured by the Dutch under De Ruyter 1667, and here the mutiny of the Nore burst forth 1798. Pop. (1881) 13,941; (1901) 14,000.

SHEERS, or SHEARS, n. plu. *shērz* [see SHEAR]: in *ships*, two or more masts or pieces of timber having their lower ends secured to the sides of the vessel, and their upper or vertical ends, which slope to each other, fastened together and fitted at the joint with a pulley—used for hoisting heavy weights, as masts. SHEER-HULK, an old ship fitted with sheers.

SHEET, n. *shēt* [AS. *sceat*, a projecting corner—from *sceotan*, to shoot: Icel. *skaut*, the lap, the corner of a sail: Gael. *sgòd*, corner of a garment, or of a sail: Dut. *schoot*, a shoot, sheet]: any open piece of cloth not made up into a shaped garment; a broad large piece of anything made thin, as paper, linen, iron, etc.; in *bedclothes*, a large piece of linen or cotton cloth placed next the body; any thin covering, as a *sheet* of ice; any flat expanse, as of water; a book or pamphlet; among *seamen*, a rope attached to one or both the lower corners of a sail in order to extend it and tighten it to the wind: V. to furnish with sheets; to cover as with sheets. SHEET'ING, imp.: N. linen or cotton cloth for bedsheets; also, coarse hempen cloth used for making

Tarpaulins (q.v.). SHEETED, pp. *shēt'ĕd*, covered with a sheet, extended in form like a sheet. SHEETS, n. plu. a book, or the pages of a book; wagon-covers of oiled canvas SHEET-ANCHOR [corrupted from *shoot-anchor*—that is, the anchor *shot out* for security or preservation]: the largest anchor of a ship; hence, chief support; last refuge. SHEET COPPER, -LEAD, -ZINC, or -IRON, any one of these metals rolled or formed into broad thin plates or sheets. SHEET-LIGHTNING, lightning which appears in wide extended flashes, not forked, and is unaccompanied by thunder. SHEET-PILE, a pile of thick planks. IN SHEETS, lying flat or expanded; folded, but not bound—said of the printed pages of a book. TO SHEET HOME, to extend the sail till the clew is close to the sheet-block. *Note.*—For sizes of folded sheets of paper, see under PAPER.

SHEFFIELD, *shĕf'fēld:* city in Colbert co., Ala.; on the Memphis and Charleston, the Louisville and Nashville, the Birmingham Sheffield and Tennessee River, and 7 other railroads surveyed or building 1891; 2 m. n. of Tuscumbia, the co. seat. It is one of the youngest of the new industrial cities in the south; is in a region remarkably rich in brown hematite iron ore, oolitic limestone, and cellular coke; has 5 iron furnaces, shops of two railroads, and 40 manufacturing and commercial associations with $9,255,000 combined capital; and contains churches, graded schools, 1 state bank (cap. $100,000), and 2 weekly newspapers and a monthly magazine. Pop. 3,400.

SHEFFIELD: post village and tp. in Berkshire co., Mass.; on the Housatonic river and the Housatonic railroad; 31 m. s. of Pittsfield, 45 m. w. of Springfield. The village contains Congl., Meth. Episc., and Prot. Episc. churches; an acad., grist and saw mills; and noted white marble quarries, from which was taken the stone for Girard College, Philadelphia, and the co. court-house, New York. It is charmingly situated, and popular as a summer resort. Its attractions include the Dome, or Mt. Everett, Sagis Ravine, Bash-bish Falls, Twin Lakes, and the Berkshire soda springs. Pop. (1900) 1,804; (1910) 1,817.

SHEFFIELD, *shĕf'fēld:* important manufacturing town and parliamentary borough, in the West Riding of Yorkshire, England; cap. of an independent district, called Hallamshire (see SHIRE); picturesquely situated on several hills that slope toward the confluence of the rivers Sheaf and Don, 140 m. n.n.w. of London, with which it is connected by the Great Northern and Midland railways; 43 m. s.s.w. of York. The town, generally, is well built. It possesses many fine public buildings, such as the original parish church, supposed to have been erected in the reign of Henry I., 240 ft. long by 130 ft. broad; St. Mary's Rom. Cath. Church, surmounted by a tower 200 ft. high; the town-hall, cutlers' hall, corn exchange; the new market-hall, or Norfolk Market, with roof of glass and iron, erected by the Duke of Norfolk at a cost of about £40,000; music-hall, assembly rooms, theatres, etc. There are extensive

botanic gardens, and a fine cemetery about a mile from the town; many churches; numerous educational establishments, such as the Free Grammar School, the Collegiate School, the Wesley College, a Lancasterian and many national schools, free writing-schools, school of art, besides the Mark Firth College, opened 1879. The Mechanics Institution dates from 1832. There are free and other public libraries, an Athenæum, and a Literary Soc. The charitable institutions comprise an infirmary and several hospitals. As far back as the time of Chaucer S. was noted for manufacture of cutlery; and at the present day, an endless variety of articles in brass, iron, and steel is produced here; e.g., knives of every sort, silver and plated articles, Britannia-metal goods, coach-springs, spades, spindles, hammers, files, saws, boilers, stoves, grates, buttons, etc. 1864, Mar., a new embankment, constructed for the Sheffield Water Company, at Bradfield gave way, and let out a body of water 95 ft. high from a reservoir 78 acres in extent. The destruction of life and property by this flood was unprecedented in England: 250 persons perished; mills, houses, and hamlets were swept from their foundations; and, apart from the ruin of the Bradfield Dam, damage was done to private property to the extent of nearly £300,000. In 1866, trade outrages, in the form of 'rattening,' long a discredit to S., were ended (see TRADE UNION). Since 1871, the introduction of the manufacture of armor-plates, railway-springs, tires, and rails has given remarkable growth to the town. The Albert Hall, erected 1873, seats 3,000 people. A street improvement scheme, begun 1875, has been carried out at a cost of more than half a million pounds. S. has several public parks (one presented 1878), and two sets of public baths. John Ruskin has founded a museum there, where he has deposited his library and an important collection of plates. Mappin bequeathed to the town pictures to the value of £100,000. In 1884, the ratable value of S. was £985,000. The borough returns five members to parliament. Mary, Queen of Scots, was imprisoned in Sheffield Manor-house, about two m. from the town, for 12 or 14 years.—Pop. (1871) 239,946; (1881) 284,403; (1891) 324,243; (1901) 380,717.

SHEFFIELD, JOSEPH EARLE: 1793, June 19—1882, Feb. 16; b. Southport, Conn. For many years he was in the cotton trade in the South. In 1835 he returned to Conn., was interested in building the New Haven and Northampton canal, and the New York and New Haven and the Chicago and Rock Island railroads. In 1860 he made large gifts to the scientific dept. of Yale Univ., which was reorganized under the name of Sheffield Scientific School. His old home in New Haven has lately been fitted up as the Sheffield Biological Laboratory of Yale. His benefactions to religious and educational institutions were more than $1,000,000. He died at New Haven.

SHEFFIELD SCIENTIFIC SCHOOL: see YALE UNIVERSITY.

SHEIK, or SHEIKH, n. *shēk* or *shāk* [Ar. *sheikh*, a venerable old man, a chief]: in *Arabia*, the chief or Lord of a tribe or clan; among *Mohammedans*, a title of persons, learned men, or reputed saints, who preach in the mosques. This title of reverence is used also as an ordinary title of respect, like Mr., Herr, etc., before the name; but only for a Moslem. The Sheikh Al-Islam is the chief Mufti of Mohammedanism at Constantinople: a title supposed to have been first assumed by Mohammed II. at his conquest of Constantinople 1453, when this place became the seat of his empire. The Sheikh of Mecca, by virtue of his supposed descent from the prophet, levies a kind of tribute on all the pilgrims to the Kaaba. The term is applied also to heads of Mohammedan monasteries (our abbot or prior) and to the higher order of religious preachers. Sheikh Al-Gebal (Ancient of the Mountain) is the name of the prince of the Assassins, or those Ismaelites of Irak, who undertook to assassinate all those whom their chief would pronounce to be his enemies.

SHEIL, RICHARD LALOR: Irish orator, dramatist, and politician: b. Drumdowney 1791, Aug. 17; d. Florence, Italy, 1851, May 25. He was educated at Stonyhurst College and Trinity College, Dublin, studied law at Lincoln's Inn and was called to the bar in 1814. His progress in his practice was slow and he turned to dramatic writing, having already produced a moderately successful drama, *Adelaide* (1814). A tragedy, *The Apostate*, was produced in 1817, and ran through the season. He produced *Bellamira, or the Fall of Tunis* (1818); *Evadne* (1819); *The Huguenot* (1822), and with John Banim, *Damon and Pythias*. Of these *Evadne* is considered the best. He next joined with Curran in contributing to the *New Monthly Magazine* the *Sketches of the Irish Bar*. In 1825 he visited London with O'Connell, O'Gorman and others to protest against the bill that had been introduced for the suppression of the Catholic Association, and during the progress of the agitation continuing until 1829 spoke many times in public meetings in Ireland in behalf of the Irish cause. When emancipation was finally secured, Sheil moved the dissolution of the Catholic Association. In 1830 he entered Parliament from Milborne Port in Dorset, sat for County Louth in 1831, and in 1833 was member of the first reformed parliament for County Tipperary. He gradually withdrew from a close identification with the Irish cause and turned his attention more to the foreign policies of the empire. Shortly after the accession of William IV. he became commissioner of Greenwich Hospital, but later exchanged this post for the vice-presidency of the board of trade. In 1846 he was appointed master of the mint and his inability to move in the relief of the famine in Ireland, though not thoroughly understood in that country, yet diminished his popularity. His last appointment was that of min-

ister to the court of Tuscany in 1850. He was brilliant in parliamentary speaking, though he lacked spontaneousness, and carefully prepared each address. Of his forensic speeches that delivered as counsel for John O'Connell at the 'monster trials' in Dublin in 1844 is accounted his best.

SHEKEL, n. *shĕk'l* [Heb.—from *shakal*, to weigh: F. *sicle;* Ger. *seckel*]: originally a certain standard weight in use in Babylonia, and later among the ancient Hebrews, by which the value of metals, metal vessels, etc., was fixed. At first it equalled one-sixtieth of a mina. The Phœnicians adopted it and variously modified it. Gradually the Hebrew shekel became a normal piece of money, both in gold and silver, marked in some way or other as a coin, though not stamped. The gifts to the sanctuary, the fines, the taxes, the prices of merchandise, all are reckoned in the Old Testament by the shekel, not counted but weighed. Three different kinds of gold, silver, and copper shekels are mentioned: the common shekel, the shekel of the sanctuary (probably of double value), and the shekel of royal weight. Besides these, there was a half-shekel (*beka*), and a fourth-shekel. The sacred shekel was equal to 20 geras (beans), and 3,000 sacred shekels made a talent. The gold shekel is reckoned approximately to contain 161 Troy grains, the silver shekel 275. During the Babylonian exile, the Persian money (*dariks*) was used by the captive Hebrews; nor do they seem to have afterward used any but the coin of their foreign rulers. It was under the Maccabeans that national money began to be struck, adorned with sacred emblems, and with inscriptions in the native language and characters. De Saulcy alone assumes, without much show of reason, Jewish coins to have existed from the time of Alexander the Great. Simon, the 'prince and high-priest,' received according to I. Macc. xv. 16, the permission from Antiochus VII. to strike coin B.C. 138. The emblems are sacred branches, sheaves, flowers, vases, etc., and the legend (in a peculiarly archaic ['Samaritan'] alphabet) contains the date, the name of the Jewish ruler, and the inscriptions 'Shekel of Israel,' 'Jerusalem the Holy,' 'Redemption of Israel.' The latest coins with Hebrew inscriptions date from the revolution of Bar Cochba under Hadrian. The value of the silver shekel is reckoned about 60 cents.

SHEKI'NAH. See SHECHINAH.

SHELBURNE, Canada: capital of Shelburne co., Nova Scotia, a seaport town on the s.w. coast at the head of a deep and capacious bay, forming one of the safest harbors of the province, 160 m. s.w. of Halifax. Shelburne is a terminus of the intercolonial railway system, and has an important maritime and transit trade. Ship-repairing docks and ironworks are the chief industrial establishments; and its fisheries are valuable. The Rose-

way river supplies abundant water power. The entrance to the harbor is marked by a lighthouse on McNutt's island; it exhibits two lights, the highest 120 ft. above the sea. After the American Revolution the population of Shelburne was increased to about 12,000 by the advent of United Empire loyalists. It has since declined in importance. Pop. (1901) 1,445.

SHELBURNE, *shĕl'bėrn*, WILLIAM PETTY, Earl of: 1737, May—1805, May; son of the first earl and descendant of Sir W. Petty. When G. Grenville succeeded Bute 1763, Shelburne, whose talents had made him remarked, though at the age of only 26, was placed at the head of the Board of Trade. When Chatham formed his second administration 1766, he made Shelburne one of the secretaries of state, though not yet 30. At the fall of Lord North's ministry 1782, George III. sent for Shelburne, and proposed to him to form a govt.: he declined, not being the head of a party, and was sent by the king to the Marquis of Rockingham with an offer of the treasury, himself to be one of the secretaries of state. According to Earl Russell, in his *Life of C. J. Fox*, it soon appeared that Shelburne was not much the colleague as the rival of Lord Rockingham, the chosen minister of the court, and the head of a separate party in the cabinet. At the death of Rockingham 1782, the king sent at once for Shelburne, and offered him the treasury, which he accepted without consulting his colleagues. Fox thereupon resigned, and Shelburne introduced William Pitt, then only 23 years old, into office as his chancellor of the exchequer. Shelburne's ministry, on the occasion of the king's announcement of his determination to concede the independence of the American colonies, found itself outvoted by the coalition between Fox and Lord North. He resigned, and the coalition ministry took his place, but soon broke up. The nation expected that the king on this event would have sent for Shelburne, but William Pitt received the splendid prize, and Shelburne was consoled by the coronet of a marquis (of Lansdowne). During the later years of his life, his health was delicate, and he withdrew from public life; but he came forward as a strong supporter of the union with Ireland. He indulged his tastes in the adornment of Lansdowne House. Here he collected a splendid gallery of ancient and modern pictures, with a library of 10,000 vols., comprising the largest collection of pamphlets and memoirs on English history and politics possessed by any man of his time, as well as a series of MSS., which were sold to the Brit. Museum for £5,000. He was a discerning patron of genius. It was while Priestley resided in Lansdowne House as the librarian and friend of Shelburne that he made the discovery of oxygen. Jeremy Bentham was one of Shelburne's intimate friends. Shelburne was patron and friend of Sir

S. Romilly, and twice offered him a seat in parliament. He was also on terms of intimacy with Mirabeau, Dumont, and other foreigners of literary and political distinction. See *Life of Shelburne,* by Lord Edmond Fitzmaurice (London 1875-6).

SHELBY, *shĕl'bĭ,* ISAAC: soldier: 1750, Dec. 11—1826, July 18; b. North Mountain, Md.; son of Gen. Evan Shelby. The family removed west, and he began his military career as lieutenant in his father's company in the battle of Point Pleasant. He entered the revolutionary army; was made captain, and given charge of the Virginia commissary dept. 1777; promoted colonel 1780. With Col. John Sevier he planned the battle of King's Mountain, for which they received the thanks of the North Carolina legislature. Col. Shelby suggested the expedition which led to the victory at Cowpens, and did good service in South Carolina. He was a member of the general assembly, and first governor of Kentucky 1792. During the second war with England he was again governor 1812-16, and at the head of a force of 4,000 vols. which he had organized gave Gen. Harrison valuable aid. In 1817 he refused the post of secretary of war under Pres. Monroe.

SHEL'BYVILLE: city, capital of Shelby co., Ill.; on the Kaskaskia river, and on the Cleveland, C., C. & St. L., and the Chicago & E. I. railroads; about 15 m. s.e. of Springfield and 33 m. s. by e. of Decatur. It is in a fertile agricultural region in which considerable attention is given to stock-raising, lumbering, and coal-mining. The chief manufacturing establishments are flour mills, foundry, lumber mills, agricultural implement works, a woolen mill, and creameries. There is considerable trade in farm and dairy products, live stock, and coal. The one national bank has a capital of $75,000. Pop. 3,650.

SHELBYVILLE: city, county-seat of Shelby co., Ind.; on the Big Blue river, and on the Cleveland, C., C. & St. L., and the Pittsburg, C., C. & St. L. railroads; about 26 m. s.e. of Indianapolis, and 90 m. n. of Louisville, Ky. It is an agricultural and stock-raising region. The chief manufacturing establishments are flour mills, creameries, barrel factories, lumber and planing mills, ice factories, wagon and carriage works, and a furniture factory. It is the commercial and industrial centre for a large part of Shelby co., and has considerable trade in farm and dairy products, live stock, and manufactures. There are 12 churches, 5 public schools and 1 parish school, and a public library. The two national banks have a combined capital of $200,000; there are several building and loan associations and one private bank. The city has had a steady growth, mainly due to the general development of the surrounding country. Pop. (1900) 7,169; (1910) 9,500.

SHELBYVILLE: city, county-seat of Shelby co., Ky.; on the Southern and the Louisville & Nashville railroads; about 28 m. e. of Louisville and 21 m. w. of Frankfort. It is in an agricultural and stock-raising region. Large quantities of tobacco, in the vicinity, are prepared for market and shipped from Shelbyville. It has a flour mill, creameries, machine shops, and cigar factories. The educational institutions are a high school, elementary schools, Science Hall School (M. E. South), opened in 1825, Stuart Female College, founded in 1839, Shelbyville Academy for Boys, opened in 1881. The three state banks have a combined capital of $100,000. The government is vested in a mayor and a common council. Pop. 3,190.

SHELBYVILLE: town, county-seat of Bedford co., Tenn.: on the Duck river, and on the Nashville, Chattanooga & St. Louis railroad; about 65 m. s. by e. of Nashville. In June 1863 the town was the scene of military operations, and during the great part of the civil war, Shelbyville and vicinity were scenes of many skirmishes. It is in an agricultural and lumbering region, and in the vicinity are several varieties of good building stone. The chief manufacturing establishments are foundries, machine shops, lumber and planing mills, a large lead-pencil factory, cotton and woolen mills, and a flour mill. The chief products shipped are pencil-cedar, telegraph and telephone poles, grain, and mules. There are six churches, graded public schools, and the Shelbyville Female College, founded in 1853. The two banks have a combined capital of $128,000. Pop. (est.) 2,400.

SHELDAPPLE, n. *shĕld'ăp-pl,* or SHELD'AFFLE, *-ăf'l* [OE. *sheld,* spotted, party-colored: Icel. *skiöldr,* a shield: Dan. *skioldet,* party-colored: Norw. *skioldet,* spotted: *sheld-apple* probably stands for *sheld-dapple*]: a bird, the chaffinch. SHEL'DUCK, the hen or female Sheldrake (q.v.).

SHELDON, CHARLES MONROE: American Congregational clergyman and author: b. Wellsville, N. Y., 1857, Feb. 26. He was graduated from Brown University in 1883, from the Andover Theological Seminary in 1886, was ordained in 1886 to the Congregational ministry, and in 1889 became pastor of the Central Congregational Church of Topeka, Kan. In 1900 he attracted considerable attention by his connection with the Topeka *Capital,* of which he took entire charge for one week, and which he published as a distinctively Christian daily after principles enunciated in his book, *In His Steps* (1896), a work of excellent intention, but no literary importance, which was sold very extensively in the United States and Great Britain. Among other volumes by him are: *Robert Hardy's Seven Days* (1892); *Malcolm Kirk* (189[illegible]); *The Wheels of the Machine* (1901); *The Narrow Gate* (1902); *The Heart of the World* (1905).

SHELDON, *shĕl'don*, GILBERT, D.D.: 1598, July 19—1677, Nov. 9; b. Staunton, Oxfordshire, England. He graduated at Trinity College, Oxford, took orders, and 1635 became warden of All Saints and chaplain to Charles I. He suffered imprisonment for devotion to the royal cause, and lived in retirement several years. Under Charles II. he became bishop 1660; archbishop of Canterbury 1663; and chancellor of Oxford University 1667. He made large gifts for charitable purposes, and built the Sheldonian Theatre for Oxford, designed by Sir Christopher Wren and costing £16,000.

SHELDRAKE, or SHELLDRAKE, *shĕl'drāk* (*Tadorna* and *Casarka*): genera of ducks of the section having the hind-toe without any pendent membrane. The sheldrakes are a connecting link between geese and ducks, having much resemblance to the former. The species are mostly natives of the s. hemisphere; but the COMMON SHELDRAKE (*T. vulpanser*, or *Bellonii*) is common on the sandy sea-shores of Britain; many coming from the north for the winter, and some remaining all the year, and breeding, making their nests in rabbit-burrows or other holes in soft soil, whence in some places the sheldrake receives the name *Burrow Duck*. It is a beautiful bird, the sexes nearly alike in plumage; the head and upper part of the neck green, with a collar of white, and a lower collar of rich chestnut, extending over part of the back, the rest of the back white. The whole length is fully 2 ft. The sheldrake is very capable of being tamed, and breeds in domestication. Its note is a shrill whistle. Its flesh is coarse and unpalatable.—The RUDDY SHELDRAKE (*T. rutila*), the only other European species, is common in many parts of Europe and Asia.—In the United States the name sheldrake is improperly given to the Red-breasted Merganser, from some resemblance of color.

SHELF, n. *shĕlf*, SHELVES, n. plu. *shĕlvz* [AS. *scylfe*, a board, a shelf: Dut. *scnelf*, the scaffold on which a mason stands: Low Ger. *schelfen*, to raise on a scaffold or boarding: Scot. *skelve*, to separate in laminæ]: a flat board fixed horizontally against a wall, on which articles may be laid or stored; a shoal or sand-bank in the sea; a ledge of rocks; a flat projecting rock. SHELF'Y, a. *-ĭ*, full of shelves or hidden rocks. SHELVE, v. *shĕlv*, to place on a shelf; to put aside or out of use or notice, principally used with respect to persons; to be sloping. SHELV'ING, imp.: ADJ. sloping: N. materials for shelves. SHELVED, pp. *shĕlvd*. SHELVY, a. *shĕlv'ĭ*, full of shelves or dangerous shoals. SHELV'INESS, n. *-ĭ-nĕs*, the state of being shelvy. LAID ON THE SHELF, or SHELVED, laid aside from active professional work; laid aside from any position or expectation; said of any measure or question set aside or allowed to drop.

SHELL, n. *shĕl* [Dut. *schel*, shell: Ger. *schale*, a shell, bark of a tree: same as *scale* and *shale*]: the hard or stony covering of some fruits and seeds, and of certain animals, as crabs; a pod or seed-case; the stony covering of a mollusk, as the mussel, the oyster, etc. (see below): the hard outer coat or covering of anything, as of an egg; the superficial part; a husk; outward show; a house partly built: in *mil.*, a hollow shot filled with an explosive and destructive compound (see below): a rough coffin: V. to strip or break off the shell; to be freed from the husk; in *mil.*, to fire shells at. SHELL'ING, imp.: N. groats, in commercial language. SHELLED, pp. *shĕld:* ADJ. separated from the shell; under fire of shells. SHELL-LESS, a. without shells, applied to certain mollusks. SHELLY, a. *shĕl'ĭ*, abounding with shells; consisting of shells. SHELLBARK, a species of hickory, or its bark. SHELL-CAMEO, an imitation of the antique cameo cut on a shell instead of a stone. SHELL-FISH, a water-animal incased with a hard and stony covering, as the mussel, the oyster, etc. SHELL-JACKET, an undress military jacket. SHELL-LIME, lime made by burning the shells of shell-fish. SHELL-MARL, in *geol.*, a deposit of clay and other substances mixed with shell-remains, found valuable as a manure. SHELL-MOUNDS, the mounds found in many places on the shores of northern Europe, and composed largely of the shells of the oyster, the cockle, the mussel, and other edible mollusca—remains of anc. feasts (see KITCHEN-MIDDENS). SHELL OUT, *familiarly*, bring out your money. SHELL-PROOF, in *mil.*, parts of a fortified place rendered capable of resisting the explosive and destructive power of shells. SHELL-SAND, on certain coasts, the sands composed in great measure of broken and worn shells, and often containing a small proportion of organic matter. It is a very useful manure, particularly for clay soils, heavy loams, and newly-reclaimed bogs. It is also advantageously applied to any soil deficient in lime. It neutralizes the organic acids which abound in peat, and forms with them compounds which serve as food for plants. Shell-sand is much used as manure in some maritime districts of Britain, and of France, as Bretagne and Normandy. SHELL-WORK, ornamental work composed of shells, or adorned with them. BLIND-SHELLS, shells which contain no bursting charge. INCENDIARY SHELLS, shells filled with a highly combustible composition, employed for setting fire to distant buildings, etc. SEGMENT SHELL, a shell built up of iron segments inclosed in a thin iron covering.

SHELL: hard outer covering of a large number of invertebrate animals. Shells are found in the *Echinodermata*, in the great majority of the *Mollusca* (excluding the Molluscoids), in a few of the *Annelida*, as Serpula, Spirorbis, etc., in the *Cirropoda*, and in the *Crustacea;* also in some *Protozoa*, among the lowest of animals; and, among the highest, certain fish, such as the trunk-fish and hippocampus; turtles in the class *Reptilia*, and armadillos in the class *Mammalia*—in the higher animals the shell being hardened integument, the turtles with the addition of expanded rib-plates. For forms of the varieties of shells, see

names of the classes of animals to which they respectively belong. The intimate structure of shell was formerly misunderstood: the doctrine was, that shell is not only extravascular (or devoid of vessels), but completely inorganic, being composed of an exudation of calcareous particles (chiefly carbonate of lime) cemented together by a kind of animal glue. It is now known that shell always possesses a more or less distinct organic structure, which in some cases resembles that of the *epidermis* of the higher animals, while in others it approximates to that of the *derma*, or true skin. The nature of the organic structure is so different in the Echinodermata, Mollusca, and Crustacea, that a separate description is required for each, and, as Dr. Carpenter remarks: 'Even in the subordinate divisions of these groups, very characteristic diversities are frequently observable, so that, as in the case of the teeth, it is often possible to determine the family, sometimes the genus, and occasionally even the species, from the inspection of a minute fragment of a shell, as well fossil as recent.'

In the *Echinodermata*, the elementary structure of the skeleton shows a network of calcareous and animal matter

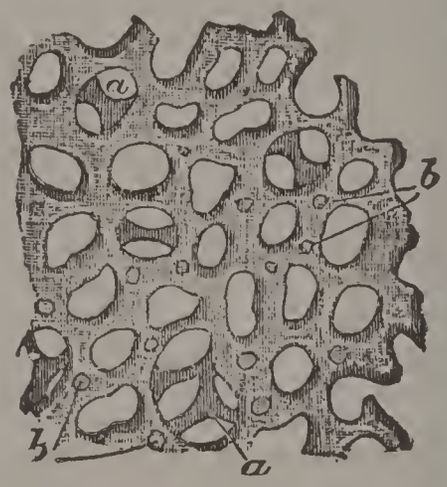


Fig. 1.—Thin Lamina of Shell of Echinus, showing its **Areolar** Structure:

a, *a*, portions of subjacent layer: *b*, *b*, fractured bases of columns connecting the superposed laminæ. Magnified 164 diameters.

intimately united. The diameter of these apertures or meshes of network varies to a certain degree in different parts of the same shell, the openings being larger in the inner than the outer layers, the extremes being $\frac{1}{450}$ and $\frac{1}{1000}$ of an inch. The entire shell is made up of an immense number of such plates, parallel to one another, separated by minute vertical pillars.

In the *Mollusca*, the shell is formed upon the surface of the mantle, which corresponds to the true skin of other animals: hence it must be regarded as epidermic. It consists of cells consolidated by a deposit of calcareous salts in their interior; but, as in the case of many other tissues, the original cellular organization often becomes so hidden by subsequent changes as to cease to be recognizable. The typical condition of the shell in this sub-kingdom is seen best in certain bivalves—the genus *Pinna*, for example. On breaking off a small portion of the projecting

margin of one of these shells, and examining it under the microscope, it is found to be made up of a vast number of prisms, hexagonal in form, and nearly uniform in size, arranged perpendicular to the surface of the lamina of the shell, so that the thickness of the lamina is formed by their length, and its surfaces by their extremities. On submitting such a lamina to the action of a dilute acid, the

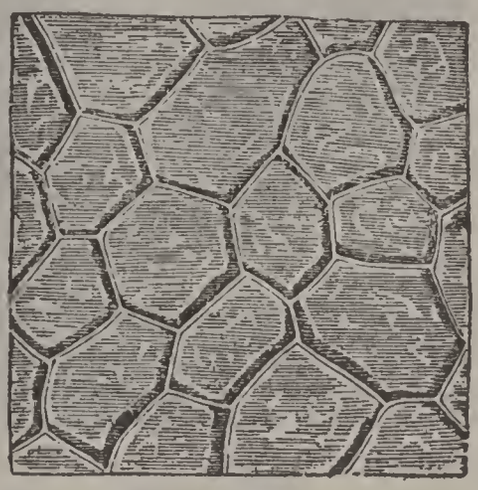


Fig. 2.—Section of the Shell of Pinna parallel to the Surface, showing Prismatic Cellular Structure, cut transversely, magnified 185 diameters.

calcareous salts are dissolved, and a membrane is left which shows the prismatic structure as perfectly as it was seen in the original shell, the hexagonal divisions being evidently the walls of cells resembling those occurring in the pith or bark of a plant. It happens sometimes in recent, but more often in fossil shells, that the animal matter decays and leaves the prisms ununited and easily

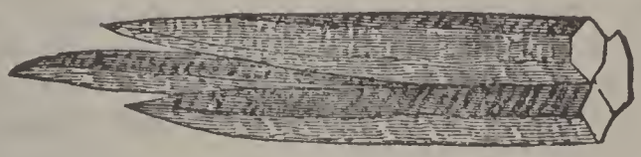


Fig. 3.—Calcareous Prisms of the Shell of Pinna, from Chalk.

separable from one another. It is only in a few families of bivalves that the cellular structure is seen in this very distinct form, or that it makes up a large portion of the shell; and these families are closely allied to *Pinna*. In many shells the external layer is formed on the above plan, while the internal layer is nacreous; in many others the nacre, or 'mother-of-pearl,' and in others sub-nacreous structure, constitutes nearly the whole thickness of the shell. The nacre, according to Sir D. Brewster, consists of a multitude of layers of carbonate of lime, alternating with animal membrane; and the grooved lines on which iridescent lustre depends are due to the wearing away of the edges of the animal laminæ, while those composed of carbonate of lime stand out; it is, however, more probable, from Dr. Carpenter's researches, that the peculiar lineation of the surface of nacre is due to the disposition of a single

membranous layer in folds or plaits which lie more or less obliquely to the general surface.

In the *Crustacea,* the structure of the shell has been examined only in the order of Decapods. In this order—in the common crab, e.g.—the shell consists of three layers:

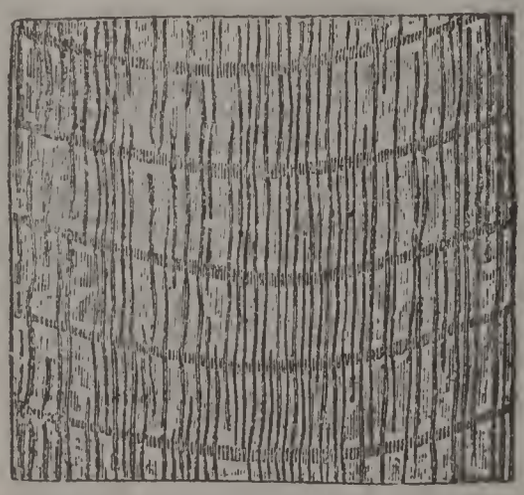


Fig. 4.—Portion of Transverse Section from Claw of Crab, magnified 400 diameters.

(1) an external horny epidermic membrane covering the exterior; (2) a cellular or pigmentary structure; (3) an internal calcareous or tubular substance. The horny layer is easily detached after the shell has been for some time immersed in dilute acid; it is thin and tenacious, with no sign of structure. The pigmentary layer is very thin in the crab and lobster, but is much thicker in some other Decapods. The internal layer constitutes the chief part of the shell; in this layer chiefly the calcareous matter is deposited; but even after this has been removed, a distinct animal basis remains, which closely resembles that which is left after the dentine of the teeth has been deprived of its inorganic constituents, as may be seen in the accompanying figure, representing a transverse section from the claw of the crab; the dark lines representing minute tubules

See further, Dr. Carpenter's various articles on the Microscopic Structure of Shells, especially 'Shell' in *Cyclopædia of Anatomy and Physiology* (from which materials for the present article have been drawn), and his *Microscope and its Revelations.*

The usual forms of S. among Mollusca (q.v.) are the spiral univalve; the doubly-convex bivalve; and the boat-shape, or else coiled and chambered structures of nautili. But the forms in the past and present are infinitely varied. In the Haliotis (q.v.) a really spiral univalve presents only the appearance of half a bivalve; in Limpets (q.v.) a simple open cone; in Dentalium (q.v.) the S. is prolonged into an uncoiled tube; in Chitons (q.v.) it is broken up into 8 transverse imbricated plates. On the other hand, the bivalves exhibit some equally remarkable disguises. The fossil Hippurites (q.v.) and Radiolites resemble horns, one valve serving as a lid on the large end; in Diceras (q.v.) and other species the valves assume the shape of two

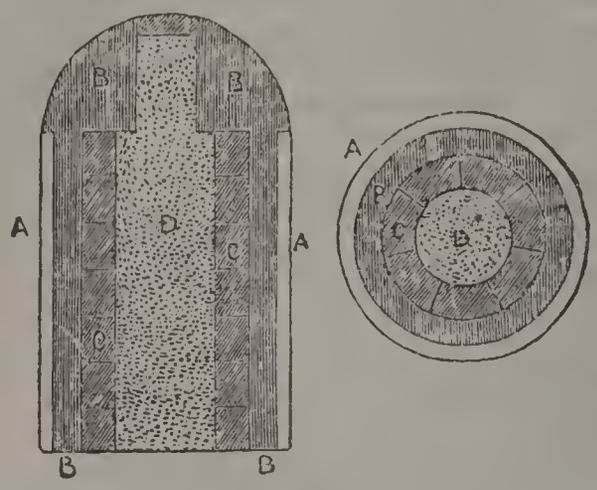
horns; in Solen the valves become extremely elongated; in Aspergillum (q.v.) a tube with perforated nozzle obscures the small valves, and these are concealed also in the rock or wood-boring species and in Vermetes, all having cases like some sea-worms, so that Teredo (q.v.) is even called mistakenly the 'ship-worm.' In the Cephalopoda (q.v.) the shell is in many species internal, even when a gasteropod-like coil as in Spirula; and in fossil species of nautili and ammonites every possible eccentricity of form occurs, one (Turrulites) even mimicking spiral gasteropods like Turritella, and other turreted genera. The exhaustless variety of sculpture, spines, etc., in Mollusca, and the beautiful coloring (not explainable by natural selection), are well known.

SHELL, in Gunnery (ane. *Bomb*): hollow vessel of metal, containing gunpowder or other explosive compound, so arranged that it shall explode at a certain point, and spread destruction around by the forcible dispersion of its fragments. The invention of this murderous missile cannot be accurately traced. Shells were employed 1480 by the sultan of Gujerat, and by the Turks at the siege of Rhodes 1522. The Spaniards and Dutch both used them during the war of Dutch independence; and they appear to have been in general use about 1634. As shells required Mortars (q.v.) for their projection, they were not used in naval warfare until the French constructed special bomb-vessels 1681; but since that period, shell-guns, being cannon of large bore, have been introduced, and shells are now employed by all ships of war.

Until comparatively recent years, every shell was a hollow sphere of cast-iron, varying in thickness from half an inch to two inches, and in diameter from five and a half inches to thirteen inches. The sphere had a fuse-hole (like a bung-hole) an inch across, through which the charge was inserted, consisting of pieces of metal and powder to burst the shell. The hole was plugged by a fuse, which was a tube of slow-burning powder, timed to communicate fire to the charge after the lapse of a certain number of seconds. This fuse might either be kindled by hand the moment before the mortar was fired, or its ignition might be effected by the act of firing the mortar. The *Shrapnel* shell, introduced by Col. Shrapnel of the Brit. royal artillery about 1808, contained a number of bullets; and being fired at bodies of men, it was timed to explode about 100 yards before reaching them, when the shell burst, and the bullets with the fragments continued their course, diverging continually as they went, until they reached their object in a death-cloud. The *Concussion shell*, or *Percussion shell*, is one in which the charge is fired by the detonation of a cap on striking an object. If sufficiently delicate to explode on touching a soft object, and at the same time not to be exploded by the resistance of the air to its rapid flight, this form of shell is the most certain in execution.

Since the introduction of rifled ordnance, the shell has become the commonest form of projectile. It has ceased to be spherical, and is usually in the shape of an elongated

bolt. The *Armstrong* shell is a pointed bolt of iron (usually percussion), containing an inner 'segment shell,' made up



Armstrong Shell:
A, lead casing; B, outer shell; C, segments; D, charge.

of 49 segments of cast iron. Seven of these segments form a circle, or ring, and seven circles give the necessary length. A coating of lead affords a soft medium for fitting into the grooves of the gun. The shell thus made somewhat resembles a bottle without the neck. The necessary bursting charge having been inserted, the rear-end is plugged with lead, the fuse is screwed into the front, and the shell is ready for action. This projectile has a great and accurate range, and its segments cannot fail, on explosion, to do great damage. The principal drawback has been found in the lead casing, which is often thrown off in parts soon after the shell leaves the gun, and which thus falls among the foremost ranks of the army using it, sometimes inflicting severe wounds. The *Whitworth* shell is an elongated hexagonal bolt of iron or steel, cast in one piece, and with a bursting charge at the rear-end. It explodes on percussion; but the space allowed for the burster is deemed insufficient to produce the full effect which the length and correctness of the weapon's range give cause to expect. The *Lancaster* shell is oval, to fit the bore of the *Lancaster* Gun (q.v.). *Martin's* shell is charged with molten iron, which sets on fire all combustible matter on which it can be thrown. The *Diaphragm* shell, invented by Col. Boxer, of the Brit. army, has an iron division or diaphragm to separate the powder in the shell from any balls or slugs, in order that the friction of the latter may not prematurely cause the powder to explode. A six-pounder diaphragm shell contains 30 carbine-balls; an eight-inch shell 322 musket-balls. The *Palliser* shell, which is now employed in the British service, is remarkable chiefly for the hardness imparted to its fire-point by a process of 'chilling' during casting. This gives it a great power of penetration into iron plates, etc.

Whitworth Shell.

These are typical of the British service. In America, inventors, James and Read among the earliest, have given much attention to hollow projectiles. In 1856 Read produced a shell with a wrought-iron cup or washer imbedded in a groove in the shell. This would tend to expand and take the rifling of the gun, and prevent windage. Recognizing the weakness of lead as a jacket, Hubbel, in 1860, reinforced the same by including in it a wire coil. In 1861 Parrott introduced a shell with a brass or iron cup at the base, which under pressure of the exploding charge was forced into the grooves. The cup was swaged with projectiles so as to fit the grooves of the bore as nearly as possible. Hotchkiss 1862 surrounded the rear-end of his shell with a soft metal ring, expanded in firing by an annular wedge or species of *sabot*, which wedge-like segment formed a third section of the shell. The same inventor 1865 modified this missile by introducing a packing of elastic material to modify the action of the annular wedge. In 1861 Dahlgren placed projections upon the shell to fit the rifling, and also gave it a soft metal sabot to prevent windage.

As regards the use of high explosives for bursting charges various attempts (Shaffner 1866, and within a few years Lieut. Graydon and others) have been made to utilize these by protecting them from shock. The explosive is subdivided and packed in elastic material to prevent the blow of the powder, or friction and concussion with the sides of the barrel, from exploding it in the gun. Such accident has already happened several times.

The *Zalinski* shell used with the Pneumatic Dynamite Gun is of a distinct order, and is really an aerial torpedo. It is of thin metal, with a fuse arranged to work by time, on percussion, or on immersion in water. The explosive and fuse are carried in the shell proper, while a tail of wood or metal is attached to the rear-end to keep it from losing its alignment or 'balloting.' Great accuracy has been attained with it on known ranges.

The present effort is to secure penetration; and armor-piercing shells of steel, of special brand and specially treated, are constantly being tried and experimented with. The introduction of improved armor-plate has made the problem more difficult of solution.

SHEL'LABARGER, Samuel: American lawyer and politician; b. Clarke co., Ohio, 1817, Dec. 10; d. Washington, D. C., 1896, Aug. 6. He was graduated from Miami University, Oxford, Ohio, in 1842, and was admitted to the bar in 1847. In 1851 he was elected to the Ohio state legislature, and was a member of Congress in 1861-3, 1865-9, and 1871-3. He was a distinguished advocate of the Reconstruction Act, and moved the adoption of the section providing that the seceding states remain under provisional government, before being received into the Union; in 1871 he introduced what was known as the

'Ku Klux Law.' In 1869-71 he was minister to Portugal, and after his last term in Congress he was appointed a member of the civil service commission, but devoted himself to the practice of law in Washington, and held no other public office.

SHELLAC, or SHELL-LAC, n. *shĕl'lăk* [Ger. *schell-lack* —*lack*, varnish (see LAC 1)]: crude lac-resin formed into thin cakes after being melted and strained (see LAC).

SHELLER, ALEXANDER MIKHAILOVICH: Russian author: b. St. Petersburg, 1838, July 30. He was educated at the university at St. Petersburg and having become interested in educational matters founded a school for the poor. This school excited the suspicions of the authorities and in 1863 it was suppressed by the government. In 1877 he became editor of the *Zhivopismoe.* He has published *Gnilyĭa Bolota* (*Dank Marshes,* 1864); *Khleba i Zrelistch* (*Bread and Amusements*); *Des rubiăt-Stchepki letĭat* (*When Wood is Cut Splinters Fly*); *Chuzhie Grekhi* (*The Sins of Others*); and a *History of Communism.*

SHELLEY, HARRY ROWE: American organist; b. Connecticut 1858, June 8. He studied music at Yale under Professor Stoeckel and afterwards under Dudley Buck. After completing his musical education in Paris and London he began his career as professional church organist and since 1899 has been engaged at the Fifth Avenue Baptist church, New York. He has composed many songs, anthems, and organ pieces, and his sustained compositions include two sacred cantatas; a lyric music drama *Romeo and Juliet;* a lyrical intermezzo, *Santa Claus;* and a *Symphony in E major.*

SHELLEY, MARY WOLLSTONECRAFT GODWIN: English writer: b. London 1797, Aug. 30; d. 1857, Feb. 21. She was the daughter of William Godwin and Mary Wollstonecraft. In 1814 she eloped with the poet Shelley to Switzerland, and after the death of his wife Harriet Westbrooke was married to him. Subsequently they resided chiefly in Italy. While traveling with him she composed her famous romance of *Frankenstein* (1818), which excited an immense sensation. It turns on the supposed discovery by a young student of the principle of life, and the consequent formation by him of a human being. After her husband's death she devoted herself much to literary work, producing *Valperga* (1823); *The Last Man* (1826); *Lodore* (1835); *Falkner* (1837); and other works of fiction; several biographies for the Cabinet Cyclopædia; *Journal of a Six Weeks' Tour,* with Shelley, 1814; *Rambles in Germany and Italy* (1844); and an edition of Shelley's poetical works and miscellaneous writings.

SHELLEY, *shĕl'ĭ*, PERCY BYSSHE: 1792, Aug. 4—1822, July; b. Field Place, near Horsham, Sussex, England, eldest son of Timothy S. (afterward Sir Timothy S., Bart.), representative of an old Sussex family. His earlier education he received at home with his sisters. About the age of ten, he was sent to a school near Brentford, and three years later transferred to Eton. Shy and sensitive, yet self-willed and unsubmissive, he suffered from the harsh discipline of masters and the tyranny of his ruder associates. In his refusal to fag at Eton, he gave early indication of that passionate impatience of every form of compulsion not approving itself to his reason which through life distinguished him and found expression in his writings. 1810, Apr., he entered University College, Oxford. Even thus early, he had become an advanced free-thinker; and a pamphlet, *The Necessity of Atheism*, which he circulated—and was supposed to have written—during the second year of his college course, led to his expulsion from Oxford. This so irritated his father, that for some time he declined to receive him; and on his runaway marriage 1811, Sep., to Harriet Westbrook, beautiful daughter of a retired innkeeper, the estrangement between them became complete, the old gentleman consenting to allow his son a liberal yearly income, but never afterward having any intercourse with him. S.'s marriage was in its issue tragical. In 1813 a separation took place between him and his wife, who, with two children, returned to the care of her father; and three years later the unhappy woman drowned herself. The refinements of intellectual sympathy which poets desire in their spouses, S. failed to find in his wife, but for a time he seems to have lived with her not unhappily; nor to the last—though some bickerings arose between them—had he any fault to allege against her, except such negative ones as might be implied in his meeting a woman whom he liked better. The preferred one was Mary Wollstonecraft Godwin (1797–1851), daughter of the celebrated William Godwin and Mary Wollstonecraft, with whom, 1814, S. travelled in France and Switzerland, and who afterward became his second wife in an unusually happy union. She was author of the remarkable novel *Frankenstein*, whose hero, a profound student of nature, discovers the secret of creating life, and produces a monster whose history, though wild and horrible, is invested with a strong human interest. On the death of S.'s first wife, he laid claim to his children, this claim their grandfather, Mr. Westbrook, successfully resisted at law on the ground of S.'s atheism, as exhibited in the poem of *Queen Mab*, printed a year or two before for private circulation.

In 1815, living at Bishopsgate, near Windsor, S. wrote *Alastor*, one of the most finished and characteristic of his works; followed by *The Revolt of Islam*, composed 1817 at Marlow. In the interval, during a tour in Switzerland, he had formed the acquaintance of Lord Byron, with whom afterward in Italy he had much intimate intercourse. Shortly after his return from Switzerland with his wife, the suicides occurred—first of Fanny Wollstonecraft, Mrs.

S.'s sister; then of Harriet S., his former wife. In 1818, Mar., S. left England finally—as it proved—to proceed to Italy; and during that and the following year, chiefly while resident in Rome, he produced what may rank as his two finest poems—the grand lyrical drama of *Prometheus Unbound* and the tragedy of *The Cenci*. While at Venice with Lord Byron 1820, he wrote *Julian and Maddalo*, a record in enduring verse of an interesting conversation of the discussional kind between the noble poet and himself. His other works of chief importance are: *Rosalind and Helen*, begun before he left England; *The Witch of the Atlas*, written 1819; *Epipsychidion; Adonais* (lament on the death of Keats); and *Hellas* (lyrico-dramatic burst of exultation on the outbreak of the Greek war of liberty)—all three dating 1821. The winter of 1821 S. passed at Pisa; and in the April following he established himself near Lerici, in the Gulf of Spezia. His fondness for boating had through life amounted to a passion, and here he indulged it to the full. 1822, July 8, in the company of an ex-naval friend, Mr. Williams, he sailed from Leghorn, whither he had gone to welcome his friend Leigh Hunt to Italy, and was lost in a sudden squall on his voyage homeward. The bodies were, after some time, washed ashore, and were burned, as the quarantine law of the country required, in presence of Lord Byron, Leigh Hunt, and another intimate friend, Trelawney. S.'s ashes were carefully preserved, and lie buried in the new Protestant cemetery at Rome.

S.'s opinions, religious, social, and political, often were crude and were everywhere expressed with reckless vehemence. There was in them much that might reasonably offend. Naturally they roused against him a storm of obloquy; also they made him throughout life the mark of slanders. Chiefly to this evil repute it is to be attributed that, while he lived, his genius met no wide appreciation. It has been amply recognized since; though his philosophical principles, avowedly anti-Christian and anti-social, and his practical life, defiant of all moral standards recognized in civilized society, have neither gained nor deserved a reputable standing. As a poet, in sustained lyrical impetuosity S surpasses every other writer of his day; his diction is not more remarkable for its opulence than for the expressive subtlety and precision with which it defines the nicest refinements of feeling and thought; and his page flashes with imagery like a royal robe rich with gems. But too often, while he dazzles, he bewilders; he is fond of supersubtle abstractions, unsubstantial as clouds or dreams, and frequently in reading him we seem merely to be looking on wreaths of rainbow-colored mist. This want of clear and firm outlines is more or less felt throughout all his larger works, except *The Cenci*, in which a terrible story of real life is dramatized with consummate vigor and directness of treatment. The rest of his poems concern themselves mostly not with the world as it is or has been, but with a perfected world which is to be. His prose is ranked by critics on an equality with his poetry. In his later works, some have found indications of a vague Pantheism.

The most complete edition of S.'s works is that by J. Buxton Forman (4 vols. Poems, 4 vols. Prose, 1880). See Trelawney's *Recollections of the Last Days of Shelley and Byron* (1858); the *Shelley Memorials*, by Lady Shelley (1859); *Shelley's Early Life*, by D. MacCarthy (1872): and Lives by T. Medwin (1847), T. J. Hogg (1858), G. Barnet Smith (1877), J. A. Symonds (1878), and J. C. Jeafferson (1885).

By common testimony of all who knew him, S. was gentle and lovable, and of large-flowing charity. He was enthusiastic, generous, fervid, courageous, with strong rejection of authority and refusal of restraint; full of a passion of philanthropy, and with a great love for the abstract good.

SHELL-GUN: term belonging to the past, as in modern rifled artillery all guns fire shells. Before their introduction, however, shells were fired from guns of large bore and proportionately small thickness of metal, not differing materially from howitzers, except that they had greater length.

SHELTA, n. *shĕl'ta:* an ancient Celtic language, said to be peculiar to tinkers, but extensively understood and spoken by most of the confirmed tramps and vagabonds in Great Britain.

SHELTER, n. *shĕl'tĕr* [a corruption of OE. *sheld-trume*, a body of troops, a guard—from AS. *scild-truma, lit.*, a shield-troop—from *scild*, a shield; *truma*, a troop: Dan. *skjul*, cover, shelter: Icel. *skyla*, to cover, to protect]: that which covers or protects from external injury or attack; one who protects or defends; state of being covered; an asylum; a refuge; a temporary shed or hut: V. to cover or protect from injury or attack; to defend; to betake to a place of safety; to afford protection to; to hide from notice; to harbor. SHEL'TERING, imp. SHEL'TERED, pp. *-tĕrd.* SHEL'TERLESS, a. *-tĕr-lĕs*, without shelter or protection.—SYN. of 'shelter, n.': asylum; refuge; retreat; sanctuary; covert; security; protection; defense; guardian; protector; defender.

SHEL'TER ISLAND: island and town in Suffolk co., N. Y.; in Gardiner's Bay, near the e. extremity of Long Island; ½ m. from Greenport; 6 m. long; 8,000 acres. It has excellent fishing and bathing, fine yachting facilities, and ample hotel accommodations for a summer resort. The island was originally the home of the Manhasset Indians, was settled as a part of Conn. 1652. Pop. 1,800.

SHELTIE, n. *shĕl'tĭ* [corruption of *Shetland*]: a pony of a small breed from the Shetland or Orkney Islands; also called a SHOLT, *shōlt.*

SHELVE, SHELVY: see under SHELF.

SHEM, *shĕm:* eldest son of Noah: see SEMITIC.

SHEMAKHA, *shĕ-mä'kä:* former name for what is now known as the govt. of Baku, occupying the s e. portion of Transcaucasia; 14,915 sq. m. North of the Kur, and around its mouth, the surface is level, low, and fruitful, though little of the surface is under cultivation. Only

the towns and seaports, and in the village in their vicinity, are agriculture and industry pursued. The mountainous regions are inhabited by a rude, predatory people. Pop. 789,659.

SHEMA'KHA: city, cap. of one of the six circles in the govt. of Baku, about 70 m. w.n.w. of the town of Baku. Formerly a thriving town, with silk and other manufactures, it was destroyed by an earthquake 1859. After having been rebuilt, it was again destroyed almost entirely by another earthquake 1872. Pop. 20,000.

SHEMIT'IC. See SEMITIC.

SHENANDOAH, *shĕn-ăn-dō'a:* borough in Schuylkill co., Penn.; on the Pennsylvania, the Philadelphia & R., and the Lehigh Valley railroads; about 100 m. n.w. of Philadelphia and 12 m. n. by e. of Pottsville, the county-seat. The place was settled about 1850 by William Kelley, but was not laid out as a city until 1862; in 1866 it was incorporated as a borough. It is the commercial and industrial centre of a region rich in anthracite coal; six of the largest collieries in the country are within the limits of the borough, and a number of other large collieries are within a one-mile radius. The chief industries of the place are connected with the mining and shipping of coal; machine shops, mining-tool works, and foundries are among the manufactories. Other manufacturing establishments are hat and cap factories, brewery, and printing establishments. There are 20 churches, representing seven different denominations, seven public schools, five parish schools, and a public library. The two national banks have a combined capital of $200,000. There are also a savings bank and three building and loan associations. The government is administered by a chief burgess and a council of 15 members chosen at popular election. Pop. (1910) 25,774.

SHENANDOAH MOUNTAINS: a range in Virginia, belonging to the Alleghanies, extending n.e. and s.w., and forming the western boundary of the Shenandoah Valley.

SHENANDOAH, *shĕn-ăn-dō'a,* RIVER: in Va., largest tributary to the Potomac, draining the beautiful and fertile valley between the Blue Ridge and the principal range of the Alleghanies. It rises in two branches near the centre of the state, and runs n.e. to the Potomac, 170 m., being navigable for small boats 100 m. In the civil war, this valley was the scene of numerous conflicts, was successively occupied by the opposing armies, and finally laid waste by Gen. Sheridan in the autumn of 1864.

SHENANDOAH VALLEY, Va.: between the Shenandoah Mountains on the w. and the Blue Ridge mountains on the e. It is noted for its beautiful scenery, and the variety and beauty of its vegetation. The large forests found here contain chestnut, hickory, oak, and other

hardwood trees. The valley acquired a world-wide fame during the civil war, when it was the scene of many encounters. In 1862 took place here the campaign of 'Stonewall' Jackson (q.v.), and in 1864 it was the scene of the campaigning of Philip Henry Sheridan (q.v.).

SHEND, v. *shĕnd* [AS. *scendan*, to confound, to shame: Ger. *schande*, disgrace, shame]: in *OE.*, to ruin; to spoil; to disgrace; to degrade; to reproach; to crush; to overpower. SHEND'ING, imp. SHEND'ED, or SHENT, pp. disgraced; degraded.

SHENG-KING, or LIAO TUNG, Manchuria: the southernmost province, stretching into the Yellow Sea between the gulf of Liao Tung and Korea Bay, has an area of 37,000 sq.m., a pleasant climate, and is generally fertile. Pop. 6,000,000. The southern portion of the province is known as the Liao Tung Peninsula; at the extremity is Port Arthur, taken by Japan in the war of 1894-5, but retroceded to China on the payment of 30,000,000 taels ($21,300,000). In 1898, however, the Chinese leased it and adjacent territory including Talienwan or Dalny, to Russia. Consequent on the Boxer troubles of 1901 Russia occupied the whole of Manchuria and rapidly proceeded to colonize it. This procedure was interrupted by the Russo-Japanese war of 1904.

SHENSTONE, *shĕn'stōn*, WILLIAM: 1714-1763, Feb. 11; b. Leasowes, Hales Owen Shropshire, England; son of Thomas S. and his wife nne Penn. In 1732 he was sent to Pembroke College, Oxford, where he applied himself to the study of English poetry. In 1737 he published without his name a small volume of miscellaneous verse; 1741, appeared his *Judgment of Hercules;* 1742, *The Schoolmistress*, the work by which chiefly he is remembered. In 1745, his parents being dead, he established himself on his property of the Leasowes, where he busied himself with landscape gardening, and such was his success in beautifying his little estate with diversified surface and labyrinthine paths and winding waters, that it attracted visitors from all quarters, and brought him more fame than his poetry.

The Schoolmistress, which has secured for its author a permanent place among minor English poets, is written in the stanza and antique manner of Spenser's *Faery Queen;* and in the contrast between the stateliness of the vehicle, and the familiar and homely quality of the subject, with the graphic truth of its treatment, there is a singular charm. His other works are mostly insignificant.

SHEOL, n. *shē'ōl* (LXX. *Hades, Thanatos,* Vulg. *Inferi*), Hebrew term of very frequent occurrence (65 times) in the Old Test., and rendered by the Authorized Version; grave, hell, or pit. Sometimes it stands unmistakably for 'tomb,' although our notions of an artificially prepared grave do not originally belong to it; at other

times, it is the abode of disembodied spirits, whether good or evil. It is the place whither the dead go to be united with their 'people,' their 'ancestors,' friends, and all the departed. It was spoken of as in the centre of the earth, or below the ocean—a dismal, dark place, like the Orcus, or Tartarus of the heathen: it has gates and bars, it has chambers, valleys, and rivers, and its inhabitants—the shadows—(*Rephaim* = feeble ones), who ordinarily enjoy deep repose in this 'reign of silence,' are troubled by being called up to the surface, or tremble at the arrival among them of some great tyrant from the earth. There can be no doubt of the existence of an idea —however vague—if not of immortality, in the modern sense, yet of some state after life among the Hebrews, even in the earliest times. For the Gehenna (Ge-Hinom) of the New Test., see HELL; for the Heb. *Sheol* of the Old Test. as more or less corresponding to the Gr. *Hades* of the New Test., see HADES.

SHEPARD, *shĕp'ĕrd,* CHARLES UPHAM, LL.D.: mineralogist: 1804, June 29—1886, May 1; b. Little Compton, R. I. He graduated at Amherst Coll. 1824; assisted Professor Silliman 1827-31; lectured on natural history at Yale 1830-47; prof. of chemistry in South Carolina State Medical College 1834-61; prof. of chemistry and natural history in Amherst 1845-52, and lecturer on natural history till 1877. He made a report to the government on sugar culture in the south 1833; discovered important deposits of phosphate of lime near Charleston; and assisted in the geological survey of Connecticut 1835. He discovered several new minerals, and made valuable collections of minerals and meteorites, which were secured by Amherst College. He prepared several reports on the mines of the United States, contributed numerous papers on meteorites and other scientific subjects to the *American Journal of Science,* and pub. *Report on the Geological Survey of Connecticut* (1837); and *Treatise on Mineralogy* (enlarged ed. 1855).

SHEP'ARD, THOMAS: Puritan minister: 1605, Nov. 5 —1649, Aug. 25; b. Towcester, England. He graduated M.A. at Emmanuel College, Cambridge, 1627, and was ordained in the Church of England; but in 1630 was silenced for non-conformity, and soon afterward became tutor and chaplain in the family of Sir Richard Darby. In 1635 he emigrated to Massachusetts, reaching Boston Oct. 3; and 1636, Feb., he succeeded the Rev. Thos. Hooker as pastor of the First Church in Cambridge, which position he held until his death. He was one of the founders of Harvard, and during his life took active interest in its welfare. Among his works are *New England's Lamentation for Old England's Errors* (London 1645); *The Sound Believer* (1645); *The Clear Sunshine of the Gospel Breaking Forth Upon the Indians in New England* (London 1648); *Theses Sabbatic* (1649). He died at Cambridge.

SHEPHERD, n. *shĕp'ĕrd* [from *sheep*, and *herd*]: a man employed in tending sheep while pasturing; a swain; sometimes applied to a pastor or minister of the gospel. SHEP'HERDESS, n.-*ĕs*, a female who attends sheep while pasturing. SHEPHERD'S CROOK OR STAFF, a rod or staff armed with a blunt iron hook. SHEPHERD-KINGS, anc. race of kings who are said to have conquered Egypt, called usually Hyksos (q.v.). SHEPHERD'S-PURSE, common weed (see below). SHEPHERD'S ROD OR STAFF, a plant known as the TEASEL (q.v.).

SHEP'HERD'S DOG, or SHEEP-DOG: most useful and valuable of all kinds of dog, and employed by shepherds throughout Europe and in the countries colonized from Europe, also in parts of Asia, to assist them in tending their flocks. Without it, the shepherd would be incapable of taking care of the great number of sheep often under his charge; and the expense of keeping the requisite number of shepherds would more than cancel the profits of sheep-farming. That the dog was employed in tending sheep in very ancient times, we learn from the allusion to the *dogs of the flock* in Job xxx. 1. Buffon imagined the shepherd's dog to be the original of all the domesticated dogs; but was unable to show ground for the opinion. The S. D. shows nearly the same characters in all parts of Europe, though there are slight diversities in different countries, as between that of England and that of Scotland known as the *Collie*. It is of medium size—differences of size, however, being among the characteristics of different races; of rather slender form, with a rather sharp muzzle; the ears erect, or, in some races, drooping at the tip; the hair soft, long, shaggy, and somewhat waved; the tail slightly pendulous, more or less recurved, and very bushy; the feet well protected by hair so as to be adapted for rough ground. The eye is very bright and intelligent, though the ordinary demeanor of the animal is remarkably calm and quiet. No kind of dog is more intelligent, and perhaps none so docile; as is shown by its ready comprehension of the meaning of its master, its prompt obedience to his word or gesture, and its evident knowledge of what is requisite to be done. A S. D. exerts the utmost care to prevent sheep from straying off the road along which they are being driven, and sets itself, often of its own accord, to watch any gate or gap in the fence, or goes immediately to bring back stragglers. It is equally useful on the bleak moor or wild mountain, readily going for sheep, and bringing them from a distance. The sheep become perfectly acquainted with it, and evidently regard it as a friend, though the appearance of any other dog would alarm them at once. It knows the sheep of the flock which it is required to attend, and even in a crowded market adroitly separates them from others with which they have become mingled. Its remembrance of places is obviously accurate; and a dog which has found great difficulty in conducting sheep through crowded thoroughfares, does his work in the same locality much better on subsequent occasions. The intelligence of the S. D. has sometimes been

proved remarkably by dishonest masters employing them to steal sheep. More frequent instances are on record of the S. D. conducting a flock of sheep safely home for many miles, unaccompained by the shepherd. The S. D. is affectionate, and becomes strongly attached to its master, but is generally shy to strangers. It is very muscular and

Shepherd's Dog, or Collie.

active. The southern sheep-dog has shorter hair and a shorter tail than the northern one. The S. D. is often crossed with other kinds of dog, particularly with the pointer and setter; and such dogs may be used both as shepherds' dogs or for pursuit of game. The *Drover's Dog*, if not a distinct variety, is such a cross: it is apt to be somewhat cruel in temper.

SHEP'HERD'S PURSE (*Capsella*—formerly *Thlaspi*—*Bursa Pastoris*): annual plant of nat. order *Cruciferæ*, a most abundant weed, and remarkable as one of the few plants found over almost the whole world, adapting themselves to almost all soils and climates. It is a very variable plant, 3 inches to 2 ft. in height, with root-leaves more or less pinnatifid, all the leaves more or less toothed, and rough with hairs. The root-leaves spread closely along the ground. The flowers are white and diminutive. The pouch, from which the English name seems derived, is laterally compressed, and somewhat heart-shaped.

SHEPLEY, *shĕp'lĭ*, GEORGE FORSTER, LL.D.: soldier: 1819, Jan. 1—1878, July 20; b. Saco, Me. He graduated at Dartmouth Coll. 1837; was admitted to the bar 1840, and practiced in Bangor and Portland, Me. He was U. S. dist.-atty. 1853–61; delegate to the national democratic convention 1860; commissioned col. 12th Me. vols. 1861; took part with Gen. Butler in the capture of New Orleans, and was appointed milit. commandant and acting mayor of the city. In 1862 he was made brig.-gen. and milit. gov. of La.; commanded the milit. dist. of Va. and N. C. 1864; served with the Army of the James 1864–5, and was first milit. gov. of Richmond. After the war he resumed law practice in Me., and was U. S. circuit judge 1869 till his death.

SHEPPEY, *shĕp'pĭ*, ISLE OF: portion of the county of Kent, England; insulated from the mainland by the Swale, an arm of the estuary of the Medway; nine m. long, and four m. broad. In early times its dimensions were much greater, but the sea has encroached upon, and is gradually eating away the n. shore, which is lined by cliffs of London clay 60 to 80 ft. in height. The church of Minster, formerly in the middle of the island, is now on the n. coast. Great numbers of interesting fossils are found in the London clay, of which the whole island is composed. In the n. of the island, corn is grown, but the s. districts, which are low, are laid out in grass. Almost the whole of the inhabitants are massed in the seaport of Sheerness (q.v.).

SHEPTON MALLET, *shĕp'ton măl'ĕt*, local pron. *shĕp'on:* ancient market-town of Somersetshire, England; 5 m. e.s.e. of Wells. Its grammar school was founded 1627. Worsted stockings, crape, serge, and velvets are manufactured. It contains several large breweries. Pop. (1871) 5,149; (1881) 5,322; (1891) 5,501; (1901) 6,000.

SHERBET, n. *shĕr'bĕt* [Ar. *sharbat*, a drink or sip, a beverage—from *shariba*, to drink: It. *sorbetto;* F. *sorbet*]: favorite beverage in the East, taking the place of stimulating drinks forbidden in Mohammedan countries. It is composed of the juice of various fruits sweetened and flavored; in England, made usually from white sugar, bicarbonate of soda, tartaric acid, and a flavoring essence. In this country the name is sometimes applied to various kinds of ices used for dessert.

SHERBORNE, *shĕr'bĕrn:* market-town of Dorsetshire, England; on the river Yeo, 18 m. n.n.w. of Dorchester. It was the Saxon Scireburn, 'clear brook.' The King's School, founded 1550, has an endowment of nearly £1,000 a year, and several exhibitions tenable at either of the great English universities. There are several silk-throwing mills. Pop (1881) 5,053; (1891) 3,741.

SHERBROOKE, *shĕr'brŭk:* city in the province of Quebec, Canada; on the Magog and St. Francis rivers, and on the Grand Trunk, the Canadian Pacific, the International Passumpsic Waterloo and Magog, and the Quebec Central railways; 101 m. e. of Montreal, 121 m. s.w. of Quebec. It is the centre of an important agricultural region; has gas and electric light plants and good water; derives excellent water-power from the Magog river, which here descends 120 ft. within ½ m.; and has numerous manufactories, including woolen-mills, saw mills, iron foundries, machine-shops, and bobbin, corset, furniture, and carriage factories. It is the seat of a Rom. Cath. bp., and has a palace, cathedral, and two district churches, and 2 Anglican, 1 Meth., 1 Presb., 1 Congl., and 1 Bapt. churches. There are 13 hotels, 4 newspapers, Rom. Cath. hospital, Prot. hospital, and good public schools under joint Prot. and Rom. Cath. trustees. S. has considerable export-trade with the United States in lumber, pulp, asbestos, and live-stock. Pop. (1890) 10,000; (1901) 11,765.

SHER'BROOKE, Viscount: see LOWE, ROBERT.

SHERD, n. *shĕrd* [see SHARD]: a fragment, as of an earthenware vessel.

SHERE A'LI: see AFGHANISTAN.

SHERIDAN, *shĕr'ĭ-dan*, PHILIP HENRY: distinguished general of the civil war: 1831, Mar. 6—1888, Aug. 5; b. Albany, N. Y. (some authorities say Somerset, O.); of Irish descent. His boyish fondness for 'playing soldier' foreshadowed his military bent. He worked for a time as a clerk, and in 1848 secured an appointment to West Point Milit. Acad., but did not graduate till 1853, having been suspended for one year on account of a quarrel with another student. On graduation he was appointed 2d lieut. 1s infantry; went into garrison at Newport Barracks, Ky.; was ordered to Texas 1854; and served in Or. and Wash. Terr. 1855–61, reaching rank of capt. 1861, May. He found his way east in the fall; acted as chief quartermaster and commissary of the Army of the Southwest in the winter 1861–2, and held a similar position at Gen. Halleck's headquarters in the Miss. campaign; but resigned the uncongenial task, and became col. of the 2d Mich. cav. 1862, May, in time to make a raid on Booneville and assist in the pursuit of the Confederates from Corinth (q.v.). He defeated a superior cavalry force at Booneville July 1; and was appointed brig.gen. vols., and transferred to the Army of the Ohio. He distinguished himself at Perryville, where he commanded a division, Oct. 8; marched to the relief of Nashville; and was given a command in the Army of the Cumberland. At Murfreesboro (q.v.), 1862, Dec. 31, 1863, Jan. 2, he made a desperate resistance when division after division had been driven back; and though his ammunition gave out and he was forced to draw back, he had given Rosecrans time to make a new disposition of his troops, and to defeat Bragg's project of crushing the Federal right. S. was appointed maj.gen. vols. to date from this battle.

During the summer he was engaged in skirmishes against Van Dorn and Forrest, and crossed the Cumberland Mts. and the Tennessee river with Rosecrans's army in pursuit of Bragg. In the battle of Chickamauga (q.v.), Sep. 19–20, his division made desperate resistance. Gen. Grant superseded Rosecrans, arriving at Chattanooga Oct. 30, and S. was prominent in the battles that followed (see CHATTANOOGA, BATTLES OF). After carrying the intrenchments at the foot of Missionary Ridge, he impetuously pursued the enemy across the summit and down the other side. In this action first he attracted the special attention of Gen. Grant, who declared him the very man whom he wanted to command the cavalry of the Army of the Potomac, whither he was transferred 1864, April 4. He was in the battle of the Wilderness May 5–6, and May 9–24 with his accustomed skill and dash conducted a raid in advance of the main army to cut off the Confederate line of communication with Richmond. During May, June, and July, he fought 18 battles, in addition to protecting the flanks of the army

GENERAL P. H. SHERIDAN.

and reconnoitering the enemy's position. At Yellow Tavern, May 11, he won a victory over the cavalry gen. J. E. B. Stuart, who was mortally wounded in the engagement. The battle of Hawes's Shop took place May 28, and Cold Harbor May 31. June 7 two divisions of cavalry under S. started out to destroy the Virginia Central railroad, defeated Wade Hampton June 11 near Trevilian Station, tore up the railroad east and west, and rejoined the army June 19.

In Aug. S. took command of the Middle Milit. division. The work before him was to drive the enemy out of Va., destroy the stores, and relieve the apprehension felt at Washington. The opposing armies lay near each other. The Confederates, commanded by Gen. Early, held the w. bank of Opequan creek, and protected Winchester. Gen. Grant visited S. at this time, and, finding him so enthusiastic and confident, left the conduct of the campaign with him, not showing the plan which he had brought. S. attacked Early at the crossing of the Opequan Sep. 19, and drove him through Winchester, capturing 5,000 prisoners; overtook him and again defeated him, Sep. 22, at Fisher's Hill, pursuing him to the mountains, and devastating the valley on his return. These actions gained him the promotion of brig.gen. U. S. A. Early was reinforced by troops from Gen. Longstreet's command, and Oct. 18, by a rapid and secret march, he surprised the Union troops. S. had been absent in Washington, and on his return had reached Winchester, 20 m. from the scene of struggle. He heard the sound of firing, met stragglers from the routed Union army, and quickly comprehended the situation. Spurring his horse, and shouting to the retreating soldiers, 'Face the other way, boys; we are going back!' he galloped to the front, rode up and down the lines to inspire the men with his presence, attacked the enemy vigorously, recaptured prisoners and arms, and turned disaster into one of the most famous victories (see CEDAR CREEK, BATTLE OF). S was made maj.gen. U. S. A. for 'personal gallantry, military skill, and just confidence in the courage and patriotism of his troops' displayed at this time. After driving the Confederates out, S. devastated the Shenandoah valley, destroying barns, crops, and factories; in Feb. he received the thanks of congress for his conduct of this campaign.

In 1865, Feb. 27—Mar. 24, with 10,000 cavalry, S. raided the country from Winchester to Petersburg, destroying the James River and Kanawha canal, and tearing up and burning railroads and bridges. At Waynesboro he assaulted the Confederate works under Gen. Early, and secured 1,500 prisoners and 11 pieces of artillery; and Mar. 27 rejoined Grant, under whose direct command he was engaged in all the battles of the Army of the Potomac till the surrender of Lee's forces. Lee had sent out men to protect the railway connections on which he depended for supplies. S attacked them near Dinwiddie Court-House, and advanced toward Five Forks, but Mar. 31 was forced to fall back to Dinwiddie. Being reinforced and given

additional command, he again advanced on Five Forks, Apr. 1, and utterly routed the Confederates (see FIVE FORKS, BATTLE OF). Lee withdrew from Petersburg the next day. S. pursued the retreating army; participated in the battle of Sailors' Creek Apr. 6, and minor engagements; and was present at the surrender of Lee's army at Appomattox Court-House.

He took command of the milit. division of the Gulf 1866 July; and when it was made the dept. of the Gulf continued in command till 1867, Mar.; was in charge of the La. and Tex. milit. dist. Mar.—Sep., and of the dept. of the Mo. 1867, Sep.—1869, Mar., with headquarters at Fort Leavenworth, where he carried on an Indian campaign. On the inauguration of Pres. Grant, 1869, Mar. 4, S. was promoted lieut.gen., and given command of the division of the Mo., with headquarters at Chicago. In 1870 he visited Europe to watch the conduct of the Franco-Prussian war; in 1875 went to La. to repress political disturbances there. In 1883, on Sherman's resignation, S. became gen.-in-chief of the army, and in 1888, by special act of congress, was made general, which rank in the U. S. army had previously been held by only Washington, Grant, and Sherman.—S. was below medium height, but broad-shouldered, and with a self-possessed and resolute bearing. He was admired and loved by his men, who affectionately called him 'Little Phil.' He died at Nonquitt, Mass., and was buried in the national cemetery at Arlington.

SHER'IDAN, RICHARD BRINSLEY BUTLER: dramatist: 1751, Sep.—1816, July 7; b. Dublin; second son of Thomas S., lecturer on oratory and elocution, and compiler of an English dictionary. He was sent to school at Harrow, where he gave no promise of the brilliancy which he afterward displayed. He does not seem to have been brought up to any regular employment; and after his elopement and marriage, 1773, with Miss Linley, a public singer of great beauty and accomplishment, his prospects did not seem bright, especially as he insisted, on a point of pride, that his wife should give up her profession. However, he found means to take and furnish a good house in London, to which his own brilliant social qualities and his wife's beauty and wit drew a large number of people prominent in society or in literature. To literature, as the readiest resource, he now betook himself. The lighter drama was the sphere which attracted him, and 1775, Jan., his first comedy, *The Rivals*, was produced. Almost a failure on its first appearance, through poor acting of the part of Sir Lucius O'Trigger, this piece on its repetition found the favor with the public which its wit and vivacity deserved, and which it has retained to this day. It made the reputation of the writer. In the year following, S. followed up his success by a farce of no very great merit, *St. Patrick's Day, or the Scheming Lieutenant*, and a second comedy, *The Duenna*, amid the sparkling dialogue of which are interspersed some songs of exquisite merit. He now became, in some unexplained manner—for though his pieces were most successful, they

could scarcely have brought him the necessary funds part proprietor of the Drury Lane Theatre. Garrick's half-share was purchased (1776) for £35,000, of which S. contributed £10,000; and 1777 his *School for Scandal* was produced there. This, by much his greatest, or at least most popular, production, instantly leaped into the popularity which it has ever since retained. His other works for the stage were the inimitably clever farce, *The Critic* (1779), and, after a long interval, *The Stranger* and *Pizarro* (1798), both adapted from the German of Kotzebue. During this interval he was deeply engaged in politics. S.'s wit and sprightliness coruscated in society as brightly as in his comedies; he was an admired table-companion. With Fox (then in power) and his wild set, these gifts made him a prime favorite; and through the influence of Fox, 1780, he was returned to parliament for the borough of Stafford. In his politics he faithfully followed Fox; and the whig party from time to time had good service from their brilliant recruit. He never failed to amuse the house; and when stirred by the trumpet-call of a great occasion, he was capable of rising to heights of noble eloquence. In particular, his famous speech urging the impeachment of Warren Hastings (q.v)., is still traditionally remembered as perhaps the grandest triumph of oratory in that stirring time (see W. Fraser Rae's *Wilkes, Sheridan, and Fox*, 1874).

In 1792, S. lost his wife; and three years later, he married Miss Ogle, who brought him £5,000—a sum to S. no doubt welcome, though a small relief to the pecuniary difficulties in which he had now become involved, and which more and more accumulated on him. Always gay and improvident he did not improve with time. His later years were years of dismal struggle, of which debt, duns, and dissipation may furnish a convenient alliterative summary. His health failed with his fortunes; and his friends, not finding him in his sickness and adversity so amusing as formerly, naturally failed him also—notably and shamefully, the Prince Regent, whose dull brains over the wine-cup he had so often brightened. Some honorable exceptions there were; among them the poets Rogers and Moore, steadily kind to him to the last. He died in London.

See his biography by Moore (questioned at some points by some writers); Hazlitt's *Lectures on the Comic Writers;* and Mrs. Oliphant's *Sheridan* in the English Men of Letters series (1883). A good edition of his works, ed. by F. Stainforth, was pub. 1874.

SHERIDAN, Thomas: 1721–1788, Aug. 14; b. Quilca, near Dublin; son of Thomas S., D.D., and father of the dramatist, Richard Brinsley S After education at Trinity Coll., Dublin, and appearances on the stage there and in London, in both which places he was also manager of theatres, he won fame as lecturer on elocution and as author. His works include *British Education* (1756); *Lectures on Elocution* (1762); *Lectures on the Art of Reading* (1775); *General Dict. of the Eng. Language* (1780, 2 vols., with special reference to pronunciation, and with a rhetor-

ical grammar prefixed); *Elements of English* (1789); *Lectures on the Reading of the Church Liturgy* (1829). He wrote also a life of Swift, whose works he edited.

SHERIF, or SHEREEF, *shĕ-rēf'* (properly SCHERIF, q.v.): among Moslems, title of a descendant of Mohammed, through his daughter Fatima and Ali. The title is inherited from both the paternal and maternal side; thus the number of members of this aristocracy is very large among the Moslems. The men have the privilege of wearing green turbans, the women green veils, and they mostly avail themselves of this outward badge of nobility—the prophet's color—while that of the other Moslems' turbans is white. Many of these sherifs founded dynasties in Africa; and the line now ruling in Fez and Morocco boasts this proud designation.

SHERIFF, n. *shĕr'ĭf* [AS. *scir-gerefa*, gov. of a shire—from *scir*, a shire: *gerefa*, a reeve or sheriff (see SHIRE and REEVE 1)]: in the *United States* and in *England*, chief officer of a county or shire, to whom is intrusted the execution of the laws: in *Scot.*, chief civil officer of a county, sometimes of a city or burgh which is itself a county, who (unlike the sheriff in England and the United States) has extensive jurisdiction as a judge within his own district, both in civil and criminal matters: he is one of three county officials so named, all appointed by the crown. SHER'IFFSHIP, n. the office or jurisdiction of a sheriff; also SHER'IFFDOM, n. and SHER'IFFALTY, n. *-ăl-tĭ*. SHERIFF-DEPUTE, in *Scot.*, formerly a sheriff who acted for the hereditary or high sheriff, whose office corresponded very nearly to the modern sheriff-substitute, but who is now, since the abolition of hereditary sheriffs, the principal sheriff of a county. SHERIFF-OFFICER, in *Scot.*, one who is charged with arrests and the service of processes, etc.; a catch-poll. SHERIFF-PRINCIPAL, in Scotland, the lord-lieut. of the county. SHERIFF-SUBSTITUTE, in *Scot.*, a civil officer or judge under the sheriff-depute. SHERIFF'S CLERK, in Scotland, the registrar of the sheriff's court, having charge of its records.—The *Sheriff*, in the United States and in England, is an officer whose duties are now chiefly ministerial. The office is of great antiquity, one of the few which may be traced back to Saxon times, and it appears originally to have been the same both in England and in Scotland. The S. was (under the earl and next to the bishop) the chief man of the shire, and seems to have possessed unlimited jurisdiction to keep the peace; to have presided in all the courts; to have punished all crimes, and have redressed all civil wrongs. This extensive jurisdiction has been gradually infringed upon, partly by exercise of the royal prerogative, partly by parliament. In England, so purely honorary and ministerial has the office become, that it has been held by a woman, and in Westmoreland the office was hereditary till 1849. The woman referred to was Anne, Countess of Pembroke—stanch royalist during the rebellion in the time of Charles I. and II.—who succeeded to the hereditary office of S. of West-

moreland 1643. The duty of enforcing the orders of the supreme courts, which now in England is a principal part of the duties of the sheriff, appears to have been engrafted on the office—probably on the theory that these orders were those of the king himself. The crown now appoints to the office. A S. continues in office one year only, and cannot be compelled to serve a second time. The office is not only gratuitous, but compulsory. In practice, country gentlemen of wealth are appointed. In the city of London, the sheriffs are appointed not by the crown, but by the citizens. The S. has important official duties in elections of members of parliament. He is, by his office, the first man in the county, and superior to any nobleman while he holds office. He has the duty of summoning the *posse comitatus*—i.e., all the people of the county—to assist him in the keeping of the queen's peace. His chief legal duty is that of executing all the judgments and orders of the courts of law. It is he who, through his bailiffs, seizes the goods of debtors or their persons, and puts them in prison.

In the United States the S. as an executive officer has functions very similar to those of the S. in an English county, though his office has no such honor. He is usually elected by popular vote. The functions of sheriffs are exercised for the United States govt. by U. S. marshals appointed for each state by the president. The deputies of a S. are responsible only to him, while he is responsible to the executive authorities and to the public.

SHERIFF-MUIR, *shĕr-ĭf-mür'*: name given to several moors in Scotland on account of the 'wapinschaws' formerly there held, under superintendence of the sheriff. The only moor of this name prominent in Scottish history is in Perthshire, on the n. slope of the Ochils, 2 m. n.e. of Dunblane, and was the site of the great battle between the adherents of the Houses of Stewart and Hanover, 1715, Nov. 13. The former, who consisted of the n. clans under the Earl of Seaforth and the w. clans under Gen. Gordon, numbering about 9,000 in all, were on their march southward under leadership of the Earl of Mar, to join the Jacobites who had risen in n.w. England, when they were met by the Duke of Argyle at the head of 3,500 disciplined troops. After lying under arms all night, the Macdonalds, who formed the centre and right of the Highland army, attacked the left of their opponents, and routed it so completely that the fugitives fled with all speed to Stirling, parrying the news that Argyle had been totally defeated. Argyle, however, with his dragoons, had meantime driven the left of the Highlanders back two miles, when the right and centre returned from the pursuit, and took him in rear; he then skilfully withdrew his men to a place of shelter, and remained facing his opponents till the evening, when he retired to Dunblane and next day to Stirling. About 500 were slain on each side. As a mere battle, the victory lay with the Highlanders; but it was so little decisive that it paralyzed the action of the Jacobites almost as effectually as a defeat would have done.

SHERLOCK, *shèr'lok*, THOMAS, D.D.: English prelate; 1678—1761, July 18; b. London, son of Dr. William S., Dean of St. Paul's. He was educated at Eton, and Catharine Hall, Cambridge, where he took the degree M.A. 1701. In 1704 he obtained the mastership of the temple; 1714 became vice-chancellor of his college, taking the degree D.D.; 1716, dean of Chichester. Eleven years later he was raised to the see of Bangor, was transferred to that of Salisbury 1734, and 1748 to that of London. S. was a strenuous tory, and supported the church-and-state politics of his day. He showed diplomatic skill in his different official positions, whence Bentley nicknamed him 'Cardinal Alberoni;' his eloquence and learning were likewise of a high order.

SHERMAN, *shèr'man:* city, cap. of Grayson co., Tex.; on the Texas and Pacific, the Houston and Texas Central, and the St. Louis Arkansas and Texas railroads; 13 m. s. of Red river, 270 m. n.-by-e. of Austin. It is a wheat, fruit, and cotton region; contains many churches, high and grammar schools, co. court-house, national and state banks, Sherman Female Inst., Austin College (Preb.), daily and weekly newspapers; and is a general trade centre for a large territory. Pop. (1910) 12,412.

SHERMAN, *shèr'man*, JOHN: minister: 1613, Dec. 26 —1685, Aug. 8; b. Dedham, England. He graduated from Cambridge Univ. 1633; came to Conn. 1634; was chosen magistrate of that colony 1641; and was pastor of the First Church (Congl.) at Watertown, Conn., 1649 till his death. He was an eminent mathematician, author of several almanacs, and for many years a lecturer at Harvard College.

SHER'MAN, JOHN: statesman: 1823, May 10-1900, Oct. 22; b. Lancaster, O.; bro. of Gen. William T. S. (q.v.). His father died when he was six years old, and he was taken into the family of John S., a cousin. When 14 years of age he was prepared to enter the sophomore class in college; but, preferring independence, he began work with the engineer corps on the Muskingum improvement. Two years later he began the study of law with his brother Charles S. at Mansfield, O.; was admitted to the bar 1844, and entered into partnership with his brother. He was a delegate to the national whig convention 1848, and again 1852; was active in the organization of the republican party, and was pres. of the first Ohio republican state convention. He was a member of congress 1855-61, during which time he took part in the important debates on the Missouri Compromise, the Dred-Scott decision, slavery in Kansas, the Fugitive Slave Law, and questions of finance. His service on the committee sent to investigate the troubles in Kansas consequent on the slavery agitation gave him prominence. On account of the sickness of the chairman, he presented its report, which had important influence in the presidential campaign of 1856. Mr. S. kept

a close watch on the appropriation bills of the house, pushed the investigation of alleged navy-yard abuses, and opposed the system of making contracts in advance of appropriations. On his failure to obtain the speakership of the 36th congress after an exciting contest of eight weeks, he was appointed chairman of the committee of ways and means. He made a vigorous protest against changes in existing laws by amendments on appropriation bills; and to relieve the financial distress of the govt. secured the passage of the bill authorizing the issue of the treasury notes of 1860. He was elected to the senate 1861 to succeed Senator Chase. At the breaking out of the civil war he served as aide-de-camp to Gen. Patterson till congress met in extra session July 4. In the interval of his congressional duties he returned to Ohio, and organized the 'Sherman Brigade,' which served throughout the war. He purposed to enter the army, but was persuaded by Pres. Lincoln and Sec. Chase to remain in the senate, where he did notable service in strengthening the public credit and providing for support of troops. He urged that U. S. notes should be made legal tender, and with Sec. Chase succeeded in carrying through the National Bank Bill. Senator S. was joint author with Thaddeus Stevens of the Reconstruction Act which divided the southern states into military districts. He proposed the refunding act of 1870, and to him more than to any other man was due the resumption of specie payments, 1879, Jan. 1. Mr. S. was sec. of the treasury under Pres. Hayes 1877-81; a prominent candidate for the presidency 1880 and again 1888. He was re-elected to the senate 1881 and 1893. In 1898 he was sec. of state of the U. S. His long public career was notable for integrity and unselfish service, as well as for statesmanlike grasp of leading principles, and skillful treatment of practical details in public affairs. *Recollections of Forty Years in the House, Senate, and Cabinet,* an autobiography, appeared 1895.

SHER'MAN, Roger: signer of the Declaration of Independence: 1721, April 19—1793, July 23; b. Newtown, Mass. He worked as a shoemaker till he was 22 years old, meanwhile educating himself in law, mathematics, and politics. He was admitted to the bar 1754; elected to the gen. assembly of Conn. 1755; was a member of the upper house of the Conn. legislature 1766-85; judge of the superior court 1766-89; and member of the continental and U. S. congresses 1774-91. In 1776 he was on the committee to draw up the Declaration of Independence, and was one of its signers. He assisted Judge Richard Law in codifying the laws of Conn. 1783; was a member of the convention which framed the U. S. constitution 1787; and was prominent in the Conn. state convention which ratified it. He was mayor of New Haven 1784-93; and U. S. senator 1791 till his death. He died in New Haven.

SHER'MAN, SIDNEY: soldier: 1805, July 23—1873, Aug. 1; b. Marlborough, Mass.; descendant of Roger Sherman. He engaged in business in New York and in the west, and 1835 took arms in the struggle for Texan independence. He commanded the left wing and led the attack on the Mexican line at the battle of San Jacinto 1836, with the battle-cry, 'Remember the Alamo!' He was commissioned col. in the regular army, and sent on a mission to Ky.; returned to Tex., and was elected to congress 1842; obtained the first charter for a Texan railroad 1846; and 1854, on the anniversary of San Jacinto, he introduced the first locomotive w. of the Mississippi. In the civil war he planned the defenses of Galveston.

SHER'MAN, THOMAS WEST: 1813, Mar. 26—1879, Mar. 16; b. Newport, R. I. He graduated at West Point Milit. Acad. 1836; was engaged in the Seminole war in Fla. till 1842; served in the Mexican war, and was brevetted maj. for gallantry at Buena Vista. He served on the frontier till the beginning of the civil war; was promoted brig.-gen. vols. 1861, May; planned an expedition for seizing Bull's Bay, S. C., and Fernandina, Fla.; commanded the land troops in the Port Royal expedition 1861, Oct.—1862, Mar.; took part in the siege of Corinth, and served before New Orleans. He was brevetted brig.gen. U. S. A. for gallantry in the assault on Port Hudson, La., 1863, May, where he lost his right leg. After 9 months' leave of absence he again served in La. After the war he held commands at Fort Adams, R. I., and Key West, Fla. He was retired maj.gen. 1870.

SHER'MAN, WILLIAM TECUMSEH: 1820, Feb. 8—1891, Feb. 14; b. Lancaster, O.: distinguished soldier of the civil war. He was descended from the Rev. John S., who came from England to Watertown, Mass., 1634, in company with a cousin, Capt. John S., from whom were descended Roger S., William M. Evarts, and other eminent men. The father of William T. S., Charles R. S. (son of Judge Taylor S. of Norwalk, Conn.), married Mary Hoyt, migrated to Lancaster, O., became judge of the supreme court, and died 1829, leaving many children, of whom John S. became the distinguished congressman and sec. of the treasury. William T. S., left fatherless at 9 years of age, was informally adopted by Thomas Ewing; studied in Lancaster Acad., and entered West Point 1836; graduated with class-rank number six; was appointed second lieut. 3d artillery; served in the garrison duty and skirmishing of the Seminole war 1840–1, when he was made first lieut.; and was afterward on duty at Mobile and Charleston. In 1844, assisting Col. Churchill in taking depositions of losses in Florida by volunteers, he travelled through upper Ga. and Ala., acquiring knowledge of the country, afterward of great use in his campaigns. In 1846, after recruiting at Pittsburgh for the Mexican war, he sailed with troops July 14 from New York for California, arriving at Monterey 1847, Jan. 26, whence, soon after, as aide to Gen. Kearny, he travelled largely in California, and assisted in settling its disturbed affairs, subsequently becoming adjt.gen of Col.

WILLIAM T. SHERMAN.

Mason, who was commander of land forces after Gen. Kearny's departure; and afterward aide of Gen. P. F. Smith. In 1850 he returned by Panama; married a daughter of Thomas Ewing, then sec. of the interior; was promoted to captaincy in the commissary dept., and stationed at St. Louis until transferred to New Orleans 1852 Invited to become partner in a new banking-house (Lucas, Turner & Co., San Francisco), he went thither early in 1853, on leave of absence—the steamship being wrecked near destination, without loss of lives, and he experiencing another wreck the same day while passing the Golden Gate on a schooner. Resigning his commission after six months, he brought his family to San Francisco. By his wise energy, his bank went safely through the financial panic there in 1855. In 1856, May, he agreed to accept a commission as maj.gen. of the militia, but declined when Gen. Wool repudiated a promise to furnish arms on Gov. Johnson's requisition, for the purpose of suppressing the Vigilance Committee, which was then dealing actively with public affairs, outside the forms of law. Banking and other business in Cal. having become unsettled, the bank was discontinued 1857, at the recommendation of S., who returned east, and resumed the business under the same firm-name, 12 Wall st., New York; but, in the great financial crisis of 1857, the principal partner, in St. Louis, was obliged to suspend, and the New York house, though meeting all its obligations, was wound up. In 1858–9 S. was the business law-partner with two sons of Thomas Ewing, in Leavenworth, Kan., also opening a farm near there. 1859, July, he was elected supt. of a new milit. college near Alexandria, La., and labored efficiently for it until the opening events of the civil war compelled him to resign, leaving for the north 1861, Feb. 25, and the next month settling in St. Louis as pres. of the Fifth St. railroad, after his services had been virtually declined at Washington.

However, in May he addressed the war dept.; was appointed col. of the 13th regular infantry; and was assigned to inspection duty at Washington, by Gen. Winfield Scott, 1861, June 20; but, 10 days afterward, he was appointed to command the 3d brigade, 2d division, mostly New York vols., and held his ground in front at the first battle of Bull Run until he learned that the Union army was in retreat. Promoted to brig.gen. of vols., he was assigned 1861, Aug. 24, as 'right-hand' man to Gen. Robert Anderson (at the latter's request), commanding the dept. of the Cumberland—including the critical state of Ky., then neglected while threatened by secession forces in Tenn. After visiting the governors of Ind. and Ill., and Gen. Fremont at St. Louis, to divert to Ky. some of the enlisted forces, he was compelled, against his wish, to assume chief command, by Gen. Anderson's relinquishment on account of ill health. At Louisville he was visited by the sec. of war, Cameron, to whom he explained that, with 300 m. of frontier, against able opposing generals and forces, he needed 60,000 men for defense, or 200,000 for aggressive movements, instead

of 18,000 with poor Belgian muskets. A memorandum of this estimate by Gen. L. Thomas as 'insane' was seen and published by the inevitable marplot, a newspaper correspondent at Washington, and started the cruel story of S.'s insanity; and it seems never to have been corrected by Cameron. Stung by this injustice, and not receiving more reinforcements promised, S. was relieved at his own suggestion (Gen. Buell taking his place), and ordered to report to Gen. Halleck at St. Louis, who contradicted further malicious rumors against S., gave him the credit of suggesting the great campaign up the Tennessee river, and placed him in command at Paducah, Ky., to co-operate with Gen. Grant, chief of the Army of the Tennessee. Organizing a division there of 4 brigades, S. took command: moved to Pittsburgh Landing, on the Tennessee; had part in the great battle of Shiloh, 1862, Apr. 6 and 7, vindicating his high ability as a general; and led in the attack on outworks that resulted in evacuation of Corinth by the enemy May 29. Orders from Washington led to long delay and scattering of the conquering force. July 16 S. was placed in command of the district of w. Tenn., with headquarters at Memphis, where he wisely met the problems of military rule. His next important command was that of the expedition down the Mississippi to capture Vicksburg; but the assault, Dec. 29, failed through disobedience to orders; Vicksburg was reinforced; and the expedition was diverted to the successful movement against Arkansas Post. S. commanded the 15th corps in the assaults on Vicksburg 1863, May, and in the victory at Jackson the next month. At this time a long reply of S. to a letter of inquiry from Washington contributed much to vigorous prosecution of the war beyond temporary victories to its legitimate end. Sep. 23 he was ordered with his whole corps to relieve Rosecrans at Chattanooga (after the latter's defeat by Bragg at Chickamauga), and Nov. 25 made the hard-fought flank movement on Missionary Ridge which prepared the way for breaking Bragg's centre. After his part in the victory (for which he received the thanks of congress), he fulfilled with energy the work of relieving Burnside at Knoxville. In 1864 S. made a bold push from Vicksburg, which resulted in breaking up Gen. (Bp.) Polk's headquarters at Meridian, Miss., cutting railroads, and clearing again the Mississippi river region. In March, Gen. Grant (made lieut.gen. and ordered to Washington) wrote to S.: 'My thanks to you and McPherson as *the* men to whom, above all others, I feel indebted for whatever I have had of success.' Gen. Grant's milit. div. of the Mississippi, embracing the depts. of the Ohio, Cumberland, Tenn., and Ark., was transferred to S., who, May 5, moved from Chattanooga with 100,000 men, pushing the enemy south by successive strategies and much hard fighting, until Atlanta was evacuated Aug. 31, which event contributed much to secure the re-election of Pres. Lincoln against compromisers.

After arranging for the defense of Tenn. and Ky., and long insistence on his bold plan. S. received, Nov. 2, the

cement of Gen. Grant to 'march to the sea.' This famous movement is not to be depreciated because, as the event proved, it was very feasible. Sherman himself says that he regarded it as only 'the transfer of a strong army, which had no opponent, and had finished its then work, from the interior to a point on the coast'—'as one step in the direction of Richmond.' In fact, it cut the Confederacy in two, destroyed connecting railroads and bridges, brought war home to a deluded people, disheartened the enemy, and finally isolated the rebellion in Virginia. In connection with Gen. Grant's work there, it brought the war to a close. It was admirably prepared and conducted, the march beginning from Atlanta Nov. 15, and ending in the siege of Savannah, and its evacuation Dec. 20-21. Sherman received the thanks of Congress. 1865, Jan. 21, began his far more arduous progress northward—the campaign of the Carolinas—ending in concentration of forces at Goldsboro, N. C., and (after the fall of Richmond and Petersburg, and the surrender of Lee to Gen. Grant Apr. 9) the surrender to Sherman of the rest of the eastern Confederate army Apr. 26. Certain acts of Sherman relating to the status of the secessionists were, on orders from Washington, revoked by himself, and are fully stated in his autobiographical *Memoirs*, which give a chapter also to the military lessons of the war. The great lesson of his own campaigns, however, is, that war is war, and must be aggressively conducted as such to its thorough conclusion.

After the war he was assigned to the military division of the Mississippi (afterward Missouri), with headquarters at St. Louis, his honorary rank being the one lieutenant-general under the one general of the U. S. army —Grant. A mission to Mexico, and service on the Indian Peace Commission, followed. In 1869, March 4, on the inauguration of President Grant, Sherman was made general of the army, and moved to Washington, afterward visiting Europe 1871-2, and the Pacific coast 1883, resigning his office the same year, Nov. 1, three months before its legal expiration; thenceforth on the retired list and living in St. Louis, but removing to New York 1886. In 1884 he positively refused to be candidate for the presidency of the United States. The death of his wife 1888 occasioned severe illness. Recovering from an attack of erysipelas 1891, Feb., exhaustion and his old malady, asthma, led to his death in New York Feb. 14. National mourning, and an imposing funeral in New York and St. Louis, in which latter city he was buried, were among the many public testimonies to the great soldier.

SHERMAN: city, county-seat of Grayson co., Texas; on the Atchison, T. & S. F., the Houston & T. C., the Missouri, K. & T., the St. Louis S. W., and the Texas & P. railroads; about 64 m. n. of Dallas and 12 m. s. of the Red river. It is in the Red river valley, about

1,000 ft. above the sea. It is in a fertile agricultural region, a large portion of which ships its extensive cotton and grain products through Sherman. The great Ardmore coal fields, in Indian Territory, are about 48 m. n.w. It has a cotton gin, the original cost of which was $250,000, several large cottonseed-oil mills, flour mills, lumber mills, machine shops, brick works, foundries, broom and mattress factories, furniture factories, carriage and wagon works, bag factory, and marble works. It has an extensive trade in corn, wheat, fruit, cotton products, marble, and manufactured articles. The principal public buildings are a government building, county court-house, municipal buildings, several of the business blocks, the churches and schools. There are eight churches, the North Texas Female College (M.E.), the Sherman Institute, the Austin College for Boys (Presbyterian), St. Joseph's Academy (R.C.), the Fred Douglass High School for colored pupils, a commercial college, public and parish elementary schools, and a public library. The two banks have a combined capital of $900,000. Pop. (1900) 10,243; (1910) 12,412.

SHERMAN ACT: an act of the United States Congress, approved July 14, 1890. It was the culmination of a long disagreement between the two Houses over a financial policy, neither side being disposed to yield. This bill was supported by Senator Sherman and others as a compromise measure. It instructed the Secretary of the Treasury to buy silver bullion to the amount of 4,500,000 ounces a month, and to issue treasury notes in payment. Though the bill was approved, the financial policy continued to be a disturbing question and arguments favoring a repeal were presented at almost every opportunity. The business depression of the summer of 1893 was alleged to be a consequence of the bill, and President Cleveland summoned Congress to convene in special session, Aug. 7. A bill to repeal the silver-purchasing proviso of the Sherman Act passed the House Aug. 28. In the Senate, the Voorhees bill was presented as a substitute, its provisions being a repeal of the silver-purchasing clause, but affirming bimetallism as a national policy. After a protracted contest the Voorhees bill passed the Senate Oct. 30. It was concurred in by the House Nov. 1, and the President approved it the same day.

SHERRY, n. *shĕr'rĭ* [from *Xeres*, in Spain]: a rich, dry, white wine from Xeres, in Spain (see WINE). SHERRY-COBBLER, *-kŏb'lĕr*, sherry mixed with pounded ice, powdered sugar, and lemon, partaken by being sucked through a straw or small tube. SHER'RIS, n. OE. for SHERRY. SHER'RYADE, n. *-rĭ-ăd*, a pleasant summer beverage whose principal flavoring ingredient is sherry.

SHERWOOD FOR'EST, *shĕr'wŭd:* stretch of hilly country in w. Nottinghamshire, England; between Nottingham and Worksop; about 25 m. from n. to s., and 6

to 8 m. from e. to w. It was formerly a royal forest, the traditional scene of many of the exploits of the famous Robin Hood and his followers; but it is now almost wholly disafforested, and is occupied by gentlemen's seats and fine parks. The town of Mansfield and a number of villages are within the ancient bounds. Numerous remains of the old forest are still seen. The soil, principally a species of quartzose gravel, is in some places fertile, in others almost barren, and on the whole of moderate quality.

SHETLAND, *shĕt'land*, or ZET'LAND, anciently HIALTLAND, and presumably the *Ultima Thule* of the Romans: group of about 100 islands, islets, and rocks, 23 of which are inhabited; about 25 leagues n.e. of Orkney, 44 leagues w. of Norway; between the Atlantic and the North Sea, lat. 59° 51′—60° 50′ n., and long. 0° 53′—1° 15′ w.; but Fair Isle, which belongs to Shetland, lies to the s., and is about midway between Orkney and Shetland. Area 551 sq.m. There are three chief islands: the largest or mainland, 60 m. long by 3 to 10 broad; Yell, 20 by 6 m., and Unst, 11 by 6 m. Pop. (1901) 27,755. Lerwick, 272 m. n. of Edinburgh, 95 n. of Wick, is the only town in Shetland. It has a handsome town hall and court-house, custom-house, and other public offices, and about 70 shops; pop. about 4,000. It has a fine natural harbor and here anchors the steamer which comes semi-weekly in summer, weekly in winter, conveying passengers, mails, and most of the exports and imports of Shetland. Fort Charlotte is at the north end of the town, and adds to its picturesqueness. See old works on Shetland by Hibbert, Edmonston, and Cowie; and J. R. Tudor's *The Orkneys and Shetland* (1883). The chief imports are oat-meal, flour, tea, tobacco, spirits, sugar, cottons, woolens, timber (chiefly from Norway), tar, salt, etc. No wood grows in the country. Scalloway and Hillswick are the largest villages. The chief exports are dried salted fish, herrings, cattle and ponies, sheep, eggs, hand-knitted woolens of great beauty and fineness of workmanship, fish-oil, chromate of iron from Unst, copper ore from Sandlodge, etc.

Fishing for cod, ling, herring, is the chief industry; but each fisherman has usually a small farm, at £4 or £5 yearly rent, worked mostly by the females of his family. Nearly every house has a quern or hand-mill, and every township has one or more of the old Norse water-mills. The spinning-wheel is common, but the spindle is still in use in some parts. Carts are rare, and in many districts unknown. The sheep and ponies run at large on the Scatfield or Common, and have registered marks; but many large tracts have been inclosed and drained, and now rear first-class Cheviot and black-faced sheep. The *rivlin*, a sandal of untanned leather, is still worn. Some lands are still held runrig, and some islanders on the west still hold their stock as steel-bow. In certain dis-

tricts, till a very late period, the poor, by the Norse law, went from house to house, and stayed a longer or shorter period in each, according to the size of the farm. The Shetland dialect is a soft and pleasant English, but contains many peculiar Norse words. Many of the people still eat their fish wind-dried and slightly tainted. Young men from Shetland are employed as sailors in the Peterhead and Dundee whalers, or at some of the large shipping ports of the kingdom. They are intelligent, sober, and sedate, and are much liked as seamen. Shetland is still subjected to the *truck* or barter system in local commercial transactions. Shetland with Orkney forms a county, which sends one member to parliament. The native cattle, sheep, and horses (shelties or ponies) are small. Free landed property is termed udal, and the proprietor an udaller.

The surface is rugged and wild, largely sterile. The coasts are abrupt, and cut with deep bays or voes, and caves. The rocks are mainly gneiss, clay-slate, sandstone, granite, sienite, mica-slate, serpentine, and diallage. The highest hills are Ronas, 1,500 ft., and one of five in Foula, 1,400 ft. The coast cliff scenery is very fine, and none in Scotland surpasses that about Papa Stour. The climate is moist and variable. Southwest, s., and n. winds prevail. The mean temperature for the year is 45°, for Jan. 39°, for July 53°, winter being warmer, and summer cooler than in s. Scotland. The mean annual rainfall at Pressay is 38 inches, at East Yell, 50. The tide flows an hour earlier on the w. than on the e. side of Shetland. The prevailing diseases are dyspepsia, rheumatism, and catarrh. Infant mortality is not high. Idiocy and imbecility are frequent. Fair hair and blue eyes are very common.

Though we know little or nothing of the original inhabitants of Shetland, the physiognomy, character, and language of the present point to a Norse or Scandinavian descent. In Unst, etc., have been found cairns over long and short stone coffins, with skeletons, clay urns, weapons, and stone vessels. Tumuli and burned stones and earth are frequent, and contain remains of rude buildings and stone implements. Circular strongholds of unhewn stone called burghs, or 'broughs,' are very numerous, generally on a cliff or headland, but also on artificial islands in fresh-water lochs. Mousa Isle has the most perfect 'brough' known. In Sandsting occur very rude underground houses, with the rudest stone implements. In Bressay was found a stone of the Christian period, with an Ogham inscription. Monoliths are rather frequent. Stone circles are rare, and never large.

SHETLAND PONY. See SHELTIE.

SHEW, v. *shō:* another spelling of SHOW, which see.

SHEW-BREAD, *shō'brĕd* [tr. of Heb. *lechem happanim*, bread of the face]: among the ancient Jews,

twelve loaves of unleavened bread placed in two rows on a table in the holy place, and renewed every Sabbath. The bread was sprinkled with frankincense, which was burned each week, and the bread was then eaten by the priests within the sanctuary. The table of shew-bread was of acacia wood, overlaid with gold. See Lev. xxiv. 5-9.

SHEYTAN, n. *shā'tan* [Ar.]: Mohammedan name for the devil or a devil.

SHIAH, n. *shī'ă,* or SHEEAH, or SHIITE, n. *shī'īt:* sing. of SHIITES (q.v.). Also see SUNNITES.

SHIBBOLETH, n. *shĭb'ō-lĕth* [Heb. *shibboleth,* an ear of corn, a flood]: test-word used by the Gileadites, under Jephthah, after their victory over the Ephraimites, recorded in Judges xii. 6. It appears that the latter could not pronounce the *sh,* and by saying *s*ibboleth, betrayed themselves, and were slaughtered mercilessly. It may be noticed that all those Hebrew names in the Old Test. which begin with *sh,* have now, through the inability of the Septuagint to render this sound in Greek, become familiar to us through the versions that flowed from it, as beginning with the simple *s,* e.g., Sem, Simon, Samaria, Solomon, Saul, etc. The word Shibboleth is used to designate any watch-word or test of a sect or party.

SHIDE, n. *shīd* [Icel. *skid,* a thin piece of wood: Dut. *schieden,* to split wood: Ger. *scheit,* a splinter]: in *OE.,* a thin piece of wood; a splinter for burning.

SHIED: see SHY. SHIES, *shīz,* third pers. sing. pres. of the v. SHY.

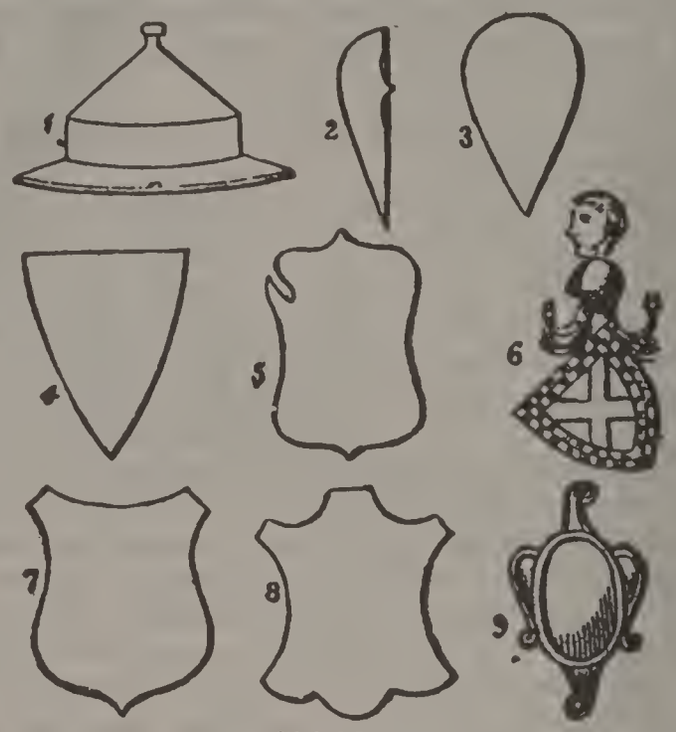
SHIEL, *shēl,* LOCH: lake in w. Scotland, part of the boundary between the counties of Argyle and Inverness, separating the district of Moidart on the n. from those of Sunart and Ardgower on the s. The head of the loch is about 16 m. w. of Fort-William. It is 15 m. long, about one m. broad, and communicates with the sea by Shiel Water and Loch Moidart.

SHIEL, n. *shēl,* or SHIEL'ING, n. [as if from *shield*]: a shelter. See SHEAL 2.

SHIELD, n. *shēld* [Ger. *schild;* Dan. *skiöld;* Icel. *skjöldr,* a shield; *skjol,* shelter, protection; *skyla,* to protect]: in *former times,* broad plate borne on the left arm as defensive armor in battle or single contest (see below): defense; shelter; one who defends or protects: in *bot.,* one of the little cups or disks containing the fructification of lichens: in *geol.,* a shell or covering: in *her.,* the escutcheon or field on which are blazoned the bearings in coats of arms: V. to cover as with a shield; to protect; to ward off; to defend. SHIELD'ING, imp. SHIELD'ED, pp. SHIELD'LESS, a. *-lĕs,* defenseless.

SHIELD: piece of defensive armor, borne on the left arm, to ward off the strokes of the sword, and missiles; constantly used from ancient times through the middle

ages, till the invention of firearms rendered it useless. The large shield worn by the Greeks and Romans (Gr. *aspis,* Lat. *clipeus*) was circular, and often ornamented



Shields.

with devices. Another form (Lat. *scutum*) was used by the Roman heavy-armed infantry, square, but bent to encircle the body. The early shield or knightly escutcheon of the middle ages was circular in outline, and convex, with a boss in the center; the body generally of wood, and the rim of metal (No. 1). In the 11th c. a form came into use which has been compared to a boy's kite (No. 2), and is said, with some probability, to have been brought by the Normans from Sicily. On shields of this shape armorial designs were first represented. These shields were in reality curved like the Roman *scutum;* but after heraldry began to be systematized, they were generally represented on seals, monuments, etc., as flattened to let the whole armorial design be seen. In the 13th c. this long and tapering form began to give place to a pear-shape (No. 3), and a triangular or heater-shape (No. 4). During the 14th c. these new forms became generally prevalent, and the heater-shape, perhaps most frequent on armorial seals, began to approach more to an inverted equilateral arch. The same variety of forms, with some modifications, continued during the 15th c., a tendency appearing in all representations of the heater-shaped shield to give it more breadth below. A notch was often taken out in the dexter chief for reception of the lance, in which case the shield was said to be *à bouche* (No. 5). After the middle of the 14th c., when the shield came to be depicted as surmounted by the helmet and crest, the shield is often represented *couché,* that is, pendent from the corner (No.

6), an arrangement said to have originated in the practice of competitors hanging up their shields prior to a tournament, where, according to De la Colombière, if they were to fight on horse-back, they suspended it by the sinister chief, and if on foot, by the dexter chief. A square shield denoted a knight-banneret. Shields of arms were often represented as suspended from the *guige*, or shield-belt worn by knights to sustain the shield and secure it to their persons.

After the introduction of firearms made shields no longer a part of the warrior's actual equipment, the form of those on which armorial bearings were depicted, on seals, monuments, brasses, etc., varied greatly, and generally became gradually more tasteless, fanciful, and unmeaning (Nos. 7, 8, 9). A tendency has been shown in recent heraldry to recur to the artistic forms prevalent in the 14th and 15th c.—In early times, shields of the form which generally prevailed at the period were exhibited on the seals and monuments of ladies; but about the 15th c. the practice began, which afterward became usual, of unmarried ladies and widows (the sovereign excepted) bearing their arms on a lozenge instead of a shield. The heraldic insignia of towns, corporations, etc., as well as individuals, are placed on shields. The bearing of Merchants' Marks (q.v.) in a shield was prohibited by the heralds of the 16th c. under severe penalties; yet not a few instances are found on monumental brasses of these devices placed on shields.

SHIELD OF DAVID: a Jewish symbol of doubtful origin, placed upon synagogues, etc. It is a hexagram in shape, formed by the combination of two equilateral triangles. It is used also as an appellation by societies. With the traditional aversion to signs and images, and the absence of references in rabbinical literature to the 'shield of David,' or 'magen David,' its origin must be sought elsewhere than in Judaism, and probably can be traced to Cabalistic application from the Templars. Some claim it to be an architectural ornament, which is found on churches as well as synagogues. Its history as a kind of amulet is obscure, but it is still employed in the ornamentation of modern synagogues, but wholly without any special motive.

SHIELDS, *shēldz*, CHARLES WOODRUFF, D.D., LL.D.: theologian and author: b. New Albany, Ind., 1825, Apr. 4; d. Newport, R. I., 1904, Aug. 26. He graduated at the College of New Jersey 1844, and at the Princeton Theological Seminary 1847. In 1849 he became pastor of the Presbyterian Church in Hempstead, Long Island, and in 1850 of the 2d Presbyterian Church of Philadelphia. In 1861 he published *Philosophia Ultima*, an exhaustive treatise on an educational plan for harmonizing science and religion. His treatise attracted much attention, and through it a new chair, of harmony of science and revealed religion, was created (1865) in Princeton

College. The professorship was given to Dr. Shields, and he held it till his death. Besides *Philosophia Ultima*, he published *The Book of Common Prayer as Amended by the Presbyterian Divines of 1661* (1864; 2d ed. 1883); *Liturgia Expurgata* (1864; 3d ed. 1884); *The Final Philosophy as Issuing from the Harmony of Science and Religion* (1877; 2d ed. 1879); *Order of the Sciences* (1884); *The Scientific Evidences of Revealed Religion* (1900); etc.

SHIELDS, JAMES: soldier: 1810-1879, June 1; b. Dungannon, County Tyrone, Ireland. He came to the U. S. 1826, studied law, was admitted to the bar, and began practice at Kaskaskia, Ill., 1832. He was elected to the legislature of that state 1836; state auditor 1839; judge of the supreme court 1843; and appointed commissioner of the U. S. land office 1845. At the beginning of the Mexican war, President Polk commissioned him brigadier-general of volunteers, and he served throughout the war under Gens. Taylor, Wool, and Scott. He was badly wounded at Cerro Gordo, and again at Chapultepec. He was mustered out of service 1848 with the rank of brevet major-general of volunteers, and was appointed governor of Oregon Territory, but resigned on being elected U. S. senator for Illinois. At the close of the term, 1855, he removed to Minnesota. When that territory became a state, 1858, he was elected U. S. senator, and at the expiration of his term, 1859, he removed to California. When the civil war began, he was again commissioned brigadier-general of volunteers, and on the death of Gen. Lander was given command of his brigade. 1862, Mar. 23, at the head of a division of Gen. Banks's army, he opened the second campaign by winning the battle at Winchester, though he had been wounded in a skirmish of the day before. 1863, Mar. 28, he resigned his commission, and soon afterward resumed the practice of law in Missouri. In 1879 he was elected by the Missouri legislature U. S. senator to fill the vacancy caused by the death of Louis V. Bogy in 1877, David H. Armstrong having, by appointment of the governor, filled the position previously. He died at Ottumwa, Iowa.

SHIELDS, *shēldz*, NORTH: seaport and market-town of Northumberland, England; in the parish of Tynemouth, on the n. bank of the Tyne, and at the mouth of that river, opposite South Shields; 8 m. e.n.e. of Newcastle. It stretches more than a mile along the river-bank, and is rapidly extending w. to accommodate its rising trade and manufactures. There are numerous collieries in the vicinity, and the Northumberland Docks, within the borough, export more than a million tons of coal a year. The harbor is bordered with quays; and the quays of North and South Shields (which are, however, separate ports) are spacious enough to accommodate 2,000 vessels of 500 tons each. Building of wood and iron vessels and tug-steamers, manufacture of anchors, chain-cables, ropes,

blocks, masts, and other articles of ship-furniture, are principal industries. North Shields has a free library, sailors' home, and theatre. The port of North Shields is one of the three wards of the municipal and parliamentary borough of Tynemouth (q.v.). Pop. about 50,000.

SHIELDS, SOUTH: port, municipal and parliamentary borough, and market-town of Durham, England; on the s. bank of the Tyne, at the mouth of that river; 9 m. e.n.e. of Newcastle by river and railway. The town stretches two m. along Shields harbor, which is lined with numerous dock-yards and manufactories. The Tyne Dock, containing 50 acres of water space, in which more than a million tons of coals are annually shipped, and a large import-trade is carried on, is within the borough. The market-place is a spacious square in the center of the town, near which is the large church of St. Hilda. The town, with North Shields, is among the chief ports in the kingdom for building of iron ships, iron screw-steamers, and tug-steamers. There are large alkali, bottle, and glass works, and every kind of manufacture connected with shipping. A steam-ferry for passengers and carriages plies day and night between the two towns, one on the north and the other on the south side of the entrance to the Tyne. Shields bar has been removed by dredging, in order, with the piers, to form a harbor of refuge. The sea-coast, in the neighborhood, is interesting from its rocks and caves. The life-boat is a South Shields invention. South Shields has a large public library, with news-room, and large hall for public meetings. There is an extensive colliery, that of St. Hilda's; a school board; and Tyne Pilotage Board. The Nautical College, founded on a bequest of £30,000, opened 1869, includes a museum and observatory. Pop. (1901) 97,267.

SHIFT, n. *shĭft* [Low Ger. *schuft;* Dut. *schoft,* the division of the day's work into four parts: Dan. *skifte,* to partition, shift, or change: Icel. *skipta,* to distribute: Sw. *skifta;* AS. *sciftan,* to divide]: a change; an expedient; something tried when another fails; last resource; in a bad sense, artifice; an evasion; a woman's under-garment; a chemise; the period during which a laborer works at a single stretch; hence, the change of workmen at the expiration of the proper time: V. to alter; to change; to change clothes; to transfer from one to another; to remove; to give place to other things; to alter in place, as a ship's cargo; to alter from one position to another; to resort to expedients for a livelihood, or to accomplish a purpose; to practice indirect methods. SHIFT'ING, imp.: N. the act of changing; the act of resorting to equivocal expedients. SHIFT'ED, pp. SHIFT'ER, n. *-er,* one who shifts: one who assists the cook on board a vessel. SHIFT'Y, a. *-ĭ,* given to change. SHIFT'INESS, n. *-ĭ-nĕs,* the quality of being shifty or changeable. SHIFT'LESS, a. *-lĕs,* destitute of expedients to provide for one's self, or to use means requisite for success. SHIFT'-

LESSLY, ad. *-lĭ*. SHIFT'LESSNESS, n. *-nĕs*, a state of being shiftless. SHIFT'INGLY, ad. *-lĭ*. TO SHIFT ABOUT, to turn quite round; to vacillate. TO SHIFT OFF, to defer by some expedient. TO MAKE A SHIFT, to contrive to make a thing serve one's purpose; to manage. A SHIFT OF LINEN, a change of linen. NIGHT-SHIFT, the division or party of workmen who labor during the night only, as opposed to DAY-SHIFT, the division of workmen who labor during the day.—SYN. of 'shift, n.': change; expedient; means; refuge; resource; fraud; artifice; stratagem; evasion; contrivance.

SHIITES, n. plu. *shī'īts* ('sectaries'), [from Ar. *shiah, shiat*, party, faction; *shi'ai*, follower of Ali—from *shâ'a*, to follow]: name given to a Mohammedan sect by the 'Sunnites' (q.v.) or orthodox Moslems. The Shiites call themselves 'followers of Ali,' and have special observances, ceremonies, and rites, as well as particular dogmas of their own. The principal difference between the two consists in the belief of the Shiites that the Imamat, or supreme rule both spiritual and secular over all Mohammedans, was originally vested in Ali Ibn Abi Taleb, and has been inherited by his descendants, to whom it legitimately now belongs. Also, they reject the Sunna or body of traditions respecting Mohammed from being any part of the law. The Persians are Shiites; the Turks, on the other hand, are Sunnites; and this division between the two nations dates chiefly from the caliphate of Mothi Lilla, the Abasside, H. 363 (about A.D. 974), when political dissensions, which ended in the destruction of Bagdad and the loss of the caliphate of the Moslems, assumed the character of a religious war. The Shiites themselves never assume that (derogatory) name, but call themselves *Al-Adeliat*, 'Sect of the Just Ones.' They are subdivided again into five sects, to one of which, that of Haidar, the Persians belong: the present dynasty of Persia deriving its descent from Haidar, descendant of Ali. Ali himself is, by some of them, endowed with superhuman attributes. —the Shiites believe in metempsychosis and the descent of God upon His creatures, inasmuch as He, omnipresent, sometimes appears in some individual person, such as their Imams. Their five sub-divisions they liken unto five trees, with 70 branches; for their minor divisions of opinions, on comparatively unimportant points of dogma, are endless. Yet in this they all agree, that they consider the caliphs Abu Bekr, Omar, and Othman, who are regarded with the highest reverence by the orthodox Sunnites, as unrighteous pretenders, and usurpers of the sovereign power, which properly ought to have gone to Ali direct from the Prophet. For the same reason, they abominate the memory of the Ommayad caliphs, who put to death Husain, son of Ali, and they still mourn his death at its anniversary. They reject likewise the Abasside caliphs, notwithstanding their descent from Moham-

med, because they did not belong to Ali's line.—Other forms of the name are *Schiites, Shiyaites.*

SHIKAR, n. *shĭ-kâr'* [Pers.]: in *India,* hunting; sport requiring firearms. SHIKAREE, n. *shĭ-kâr'ē,* a native sportsman; a sportsman: spelled also SHIKARREE.

SHIKARPUR, *shĭk-ėr-pôr':* most important trading-town, and probably most populous town, in Sinde; about 20 m. w. of the Indus, half way between Multan and Kûrrachi. The district in which it stands is so low and level that, by means of canals, which are supplied from the Indus, it is flooded every season. Its climate, notwithstanding, is said to be healthful. The inundated quarters are extremely fertile and produce great crops. Groves, orchards, and fruit-gardens surround the town; sugar-cane is largely grown. Shikarpur is on one of the great routes by the Bolan Pass from Sinde to Afghanistan, and the transit-trade to that country and to Khorassan is important. The bankers and financiers of Shikarpur are known and trusted from Astrakhan to Calcutta. Shikarpur is the chief town of the district of Shikarpur. Pop. of town about 45,000.

SHIL'KA. See AMOOR.

SHILLABER, *shĭl'a-bėr,* BENJAMIN PENHALLOW: humorist: 1814, July 12—1890, Nov. 25; b. Portsmouth, N. H. He was educated at the public schools and at Phillips Exeter Academy; at the age of 16 entered a printing-office in Dover, N. H. Two years later he removed to Boston, where he was employed in a printing-office until 1837, when he went to Demerara, British Guiana. Returning to Boston 1840, he became assistant editor of the *Post,* a position he retained for 10 years. In 1847 he published the first Mrs. Partington's saying, 'a three-line paragraph, which, I think, I "set up" without writing.' This was widely copied by the newspapers. In 1852 Shillaber left the *Post,* and in connection with Charles G. Halpine (Miles O'Reilly) started a humorous paper, the *Carpet-Bag;* but it was not successful, and he returned to the *Post,* remaining until 1856, when he became one of the editors of the *Saturday Evening Gazette.* In 1866 he retired from active life to his home in Chelsea, Mass. Besides the famous *Life and Sayings of Mrs. Partington* (1854), he published *Rhymes with Reason and without* (1853); *Knitting-Work* (1857); *Partingtonian Patchwork* (1873); *Lines in Pleasant Places* (1875); *Ike and His Friends* (1879); *Cruises with Captain Bob* (1881); *The Doublerunner Club* (1882); and *Wide Swath,* a collection of verses (1884). During his editorial life and for several years afterward he was a constant contributor to papers and periodicals. He died at Chelsea.

SHILLALAH, n. *shĭl-lā'lă,* or SHILLA'LY, n. *-lĭ,* or SHILLE'LAH, n. *-lē'lă* [from *Shillelagh,* a barony of county Wicklow, noted for its oak-forests]: among the *Irish,* a cudgel; a stout stick.

SHILLING, n. *shĭl'lĭng* [Dan. and Sw. *skilling;* Ger. *schilling,* a piece of money; AS. *scylling;* Sw. *skilja,* to divide]: English silver coin whose name is apparently from a root *skil,* to divide, either because it was a small slice of metal, or was deeply marked with an indented cross, so as to be easily broken in four. The old English coin was worth 4*d.* or 5*d.;* but after the Norman Conquest the French representative of the Roman Solidus (q.v.) was called a shilling. The shilling in the present sense seems to have been coined first by Henry VII. 1504; milled shillings were coined first by Charles II. 1662. The silver shilling is nominally worth the 20th part of a pound sterling. But the silver of which shillings are made contains 11 oz. 2 dwts. pure silver and 18 dwts. alloy; and 1 lb. by weight of this compound is coined into 66 shillings; so that each shilling contains 80.727 grains fine silver, and its value as bullion is much less than its nominal value. The shillings in the old coinages of various n. European countries have usually a much smaller value; the Danish copper *skilling* only ¼*d.*, and the silver *schilling* of Hamburg less than 1*d.* The present English shilling is worth in U. S. money about 24⅓ cents. See POUND; MINT.

SHILLY-SHALLY, n. *shĭl'lĭ-shăl'lĭ* [a corruption of the reduplication *shall I, shall I*]: foolish trifling; irresolution: AD. in an irresolute or undecided manner: V. to act in an undecided manner; to hesitate. SHIL'LY-SHAL'LYING, n. foolish trifling; irresolution: ADJ. foolishly trifling; irresolute.

SHILOH, n. *shī'lō* [Heb. *shiloh,* quiet, rest—from *shalah,* to rest]: town of anc. Palestine, division of Ephraim. It is identified with the comparatively modern village of Seilun, about 20 m. n. of Jerusalem, on the road from Bethel to Shechem. The position of the hills around it gives strength to the supposition that it was a fortress as well as a consecrated place. It was here that the ark of the covenant remained during the priesthood of Eli, and the annual 'feast of the Lord' was held. It was at one of these annual festivals that the defeated Benjamites, lying in ambush in the vineyards, seized the 'daughters of Shiloh' while dancing, and carried them to their homes in the land of Benjamin for wives.

The country around Shiloh is not attractive, but the soil is fertile, and there are evidences that the entire vicinity was once under thorough cultivation. After the carrying away of the ark by the Philistines, and the death of Eli, Shiloh sank into obscurity.

The word *Shiloh* in Gen. xlix. 10, in the patriarch Jacob's dying vision of the tribes of Israel—an impressive dream-like prophecy of their future and of the Messiah who was to come forth from them in some coming time—has had various interpretations (see Smith's *Bible Dictionary*). Of those interpretations which refer the word to a *place,* one much favored is that *Shiloh* is the

name of the city in Ephraim where the ark of the covenant remained during a long period; and the reading would be, 'Nor the ruler's staff from between his feet, till he shall go to Shiloh.' A modification of this makes *Shiloh* (which is from a root meaning *peace, rest*) mean the place or city of rest to which the promised Ruler, the Messiah, shall come, bringing his people, the Israel of God.—Of the interpretations which refer the word Shiloh to a *person*, viz., the Messiah, noticeable is that which gives it here the meaning Prince of Peace or Author of Tranquillity—'until Messiah, the Prince of Peace, shall come.'—With whatever natural interpretation, the Messianic reference of the word, and of the prophecy in which it occurs, seems undeniable.

SHILOH, BATTLE OF (known also as the BATTLE OF PITTSBURGH LANDING): 1862, Apr. 6, 7, at Shiloh, Hardin co., Tenn., 2 m. w. of Pittsburgh Landing, on the Tennessee river; between the Union troops under Gen. Grant and the Confederates under Gens. A. S. Johnston and Beauregard. It was the first engagement of consequence in the west after the fall of Nashville and the capture of Forts Henry and Donelson. Gen. Grant, pushing up the river, endeavored to cut off the communications of the Confederates, then at Corinth, in w. Tenn.; and ordered Gen. Buell to march from Nashville and join him at Pittsburgh Landing. Grant arrived with 33,000 men Apr. 1. Johnston, aware of Grant's design, moved hurriedly from Corinth with 40,000 men, expecting to attack Grant before Buell arrived. On the morning of the 6th, while Grant was eagerly awaiting Buell's appearance, Johnston attacked him and forced his army to fall back nearly to the landing. In the afternoon Buell arrived on the opposite side of the river, threw one division across, and immediately went into action. Soon afterward Johnston was mortally wounded, and Beauregard, succeeding to the command, threw his army against the center and left wing of the Union troops. The assault was repulsed, and at nightfall the gunboats supporting Grant bombarded the Confederate position, causing some retreating. During the night Buell threw the remainder of his army across the river, giving Grant a force about equal to the Confederates.

The battle of Monday, 7th, was opened under Gen. Buell's orders and direction. His left and centre advanced and became engaged with the enemy's pickets immediately after daylight, and encountered their main line at 6 A.M. McCook's two brigades moved at once into action, and were established still further to the right. The Army of the Ohio pressed steadily forward, and at 4 P.M. had possession of the camps of Stuart, Prentiss, and a part of McClernand's. The action closed soon after 4, Buell's forces at that time covering two miles of the battle-line (nearly three-quarters of it, extending as it did to the left of Lew Wallace's di-

vision), and becoming hotly engaged there, in co-operation with Wallace's left regiment. Wallace, at the close of the battle, held the front of the Army of the Tennessee, McClernand, Sherman, and Hurlbut being warmly engaged at the close in connection with the left of Wallace, and the right of McCook. About 5 P.M. the Union Army reoccupied its former camps. The best estimates of strength give Grant 33,000 at the opening of the battle, and Lew Wallace's reinforcement for the second day 5,000. The official reports give Johnston's strength at 39,000 to 40,000. The losses of Grant's army were 1,513 killed, 6,601 wounded, and 2,830 missing; total, 10,944. Buell lost 241 killed, 1,807 wounded, and 55 missing; total, 2,013. Total Union loss, 13,047. The Confederate loss was 1,723 killed, 8,012 wounded, and 959 missing; total, 10,694. Consult: *Official Records,* Vols. X., LII., Part I.; Grant, *Personal Memoirs,* Vol. I.; Sherman, *Memoirs,* Vol. I.; Van Horne, *History of the Army of the Cumberland,* Vol. I. See CORINTH; DONELSON, FORT; NASHVILLE, BATTLE OF.

SHILY. Same as SHYLY.

SHIMMER, v. *shĭm'ėr* [Ger. *schimmern;* Sw. *skimra,* to glimmer, to flicker: OHG. *sciman,* to shine; *scimo,* a bright light]: to shine unsteadily or obscurely; to glimmer; to flicker: N. a faint sparkle or glimmering. SHIM'MERING, imp. SHIM'MERED, pp. *-ėrd.*

SHIMONOSEKI: city of Japan, in Nagato province, situated on the straits of the same name at the western entrance of the Inland Sea. On the other side of the straits, on the Island of Kyushu, is the coal port of Moji, the two ports forming one large center. Though the tidal current through the straits is very strong, the anchorage is generally safe and a large number of ships are always at anchor. Both seaports were opened to foreign trade in 1899. The vessels entered at Shimonoseki and Moji during 1905 numbered 7,135, representing a total tonnage of 8,414,924. The imports during the same year amounted to 9,754,460 *yen,* and the exports to 16,240,720 *yen,* the former consisting mainly of machinery, iron ore, sugar, raw cotton and flour; and the latter of coal, cotton yarn and rice. Moji is noted for the export of coal, which amounted to 4,000,783 tons in 1905. The population of Shimonoseki is 49,000 and Moji 44,000. At the close of the China war, peace was negotiated at Shimonoseki between Li Hung-Chang and Marquis Ito.

SHIMOSE, GIAN, *shē-mō'sā yĭ'ăn:* Japanese chemist and inventor of the Shimose explosive powder; b. prov. of Hiroshima, 1858, of humble parentage. As a studious youth, recognizing the lack of educational facilities in his native town, he walked 500 miles to Tokio, where, notwithstanding the most indigent circumstances, often on the verge of starvation, and having to borrow books

to study, he graduated from the Imperial University with the highest honors. Accepting a position at $3 a week in a printing office, his skill obtained him responsible service under the government, further enhanced by his invention of an ink for bank-notes, the secret composition of which has defied imitation, and rendered counterfeiting impossible. Turning his attention to inventions that would be useful in modern warfare, after 11 years of arduous labor he perfected the explosive powder named after him, which was used with such terrible results in the Russo-Japanese war of 1904-05. Inviolate secrecy is maintained regarding its composition, but, without the simple fulminating device designated by its inventor it is non-explosive and harmless, insensible to concussions or sudden shocks, and when ignited burning with a slow flame.

SHIN, n. *shĭn* [Dut. *scheen;* Sw. *sken-ben,* the shin-bone: Ger. *schiene,* a splint, the tire of a wheel: AS. *scina,* the shin]: the forepart of the leg, or the bone of the fore-part of the leg. SHIN-BONE, bone of the shin; the tibia.

SHIN, LOCH: lake in s. Sutherlandshire, Scotland, 18 m. long, 1 m. wide. The Shin Water, famous trout-stream, carries the waters of the loch into Oikell Water. Loch Shin abounds in trout and salmon.

SHINDY, n. *shĭn'dĭ:* in *slang,* a domestic disturbance; a row generally.

SHINE, v. *shīn* [Goth. *skeinan;* Icel. *skina;* Dan. *skinne;* Ger. *scheinen,* to shine: AS. *scinan,* to shine]: to give light; to exhibit brightness or splendor; to be glossy; to gleam; to glow; to beam with a steady light; to be eminent or distinguished; in *Scrip.,* to manifest glorious excellences; to be manifest; to be propitious: N. fair weather; light; brightness; splendor. SHIN'ING, imp.: ADJ. bright; splendid; distinguished; in *bot.,* applied to a smooth and polished surface: N. clearness of light; brightness. SHINED, pp. *shīnd.* SHONE, pt. and pp. *shōn* or *shŏn,* did shine. SHINY, a. *shīn'ĭ,* bright; luminous; unclouded; glossy. TO TAKE THE SHINE OUT OF, to surpass. TO MAKE A SHINE, to make a display.—SYN. of 'shining, a.': bright; radiant; resplendent; lustrous; illustrious; glistening; effulgent; brilliant; glittering; splendid.

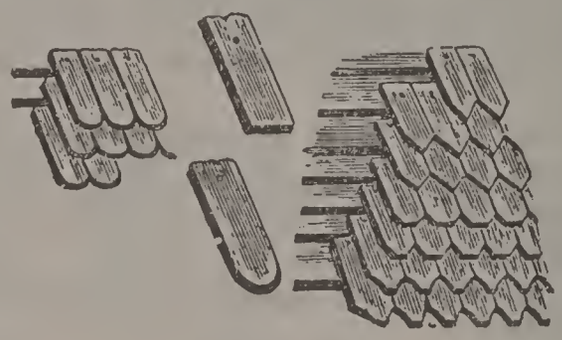
SHINE, n. *shīn:* in *slang,* quarrel; disturbance.

SHINER: name applied mostly to some small fish of the Carp family (*Cyprinidæ*). The Golden Shiner is similar to the European Bream, and sometimes reaches 1 ft. in length.—The Shiner known also as Red-fin, or Red Dace (*Minnilus cornutus*), is a common boy's-fish.—The Menhaden in Florida, and a Pacific-coast Surf-fish, are there called Shiners.—The Blunt-nosed or Pug-nosed Shiner, of family *Carangidæ,* is the Moon-fish of the south and the Hump-backed Butter-fish of Wood Holl, Mass.

SHING-KING, or LEAOTONG: see MANCHURIA.

SHINGLE, n. *shĭng'gl* [Norw. *singla*, to jingle, to clink; *singl*, gravel, shingle]: the pebbles on the sea-shore, so named from the jingling noise made by them from the movements of the waves on the beach: in *geol.*, loose angular fragments of stone—*gravel* being rounded fragments.

SHINGLE, n. *shĭng'gl*, SHIN'GLES, n. plu. *-glz* [Ger. *schindel*, a splint for a broken arm, a shingle: L. *scin'dŭla* or *scan'dŭla*, a shingle—from *scando*, I climb—so called from shingles resting on a roof like steps, one above the other]: thin slab or flat piece of wood used in roofing instead of tile or slate: the wood is chosen from the kinds that split readily and straightly; it is cut into blocks whose longitudinal faces are of the size intended for the shingles, which then are regularly split off in thicknesses of about a quarter of an inch. SHINGLE, v. to cover with shingles.



Shingles.

SHIN'GLING, imp. *-glĭng:* N. act of covering with shingles; a covering of shingles. SHIN'GLED, pp. *-gld:* ADJ. covered with shingles. SHINGLING-HAMMER, a ponderous hammer, moved by machinery, for hammering and shaping masses of iron while red-hot into oblong or square pieces. SHINGLING-MILL, a great workshop where cast or pig iron is changed into malleable iron.

SHINGLES, n. plu. *shĭng'glz* [OF. *sangle, cengle*, a girth—from L. *cingŭlum*, a girdle—from *cingĕrĕ*, to surround]: popular name for the variety of *Herpes* known as *H. zoster;* eruptive disease, usually spreading round the body like a girdle; called also *tetter:* see HERPES.

SHINTOISM: see JAPAN—*Religions.*

SHIN'TOIST, n.: a believer in Shinto.

SHINTY, n. *shĭn'tĭ* [Ir. *shon*, a club: Gael. SINTE, *sèn'chĕ*, stretched, reached, applied to the ball reaching the goal]: in *Scot.*, an outdoor game, in which a ball and clubs with crooked heads are employed, the object of each party being to drive the ball over their opponents' *hail* or boundary—the English game *hockey;* the club used in playing the game.

SHINY: see under SHINE 1.

SHIP, n. *shĭp* [Goth. *skip;* Ger. *schiff;* Dan. *skib;* F *esquif;* It. *schifo*, a ship or boat: L. *scapha;* Gr. *skaphē*, any hollow vessel, a boat—from Gr. *skaptein*, to dig, to scoop out]: generally, any large vessel for conveying goods and passengers over the sea, or on a large lake or river—

The Ship *Northfleet.*

the term being applied with great vagueness to any large vessel: in a special sense, a vessel with a bowsprit, and with three masts, each surmounted by a royal mast; but the development of steam navigation in which the largest vessels have sometimes only a schooner-rig, has tended to obliterate the special distinction: V. to put on board a ship; to convey by water; to receive into the ship, as to *ship* a heavy sea; to engage for service in a ship; to fix in its place, as to *ship* the tiller. SHIP'PING, imp.: N. ships or vessels collectively, of all sizes, but excluding boats without decks: tonnage. SHIPPED, pp. *shĭpt*, put on board a ship, as goods. SHIP'PER, n. *-pĕr*, one who puts goods on board a ship to be conveyed to a distant place. SHIP'MENT, n. *-mĕnt*, the act of putting anything on board a ship for conveyance by sea; the goods shipped. SHIP'FUL, n. *-fŭl*, enough to fill a ship. SHIP-LIKE, a. like a ship. SHIP'-LESS, a. *-lĕs*, without a ship. SHIP-BISCUIT, hard coarse biscuit prepared for long keeping, and for use on board a ship. SHIPBOARD, aboard or in a ship. SHIP-BREAKER, one whose business is to break up vessels that are unfit for sea. SHIP-BROKER, one who transacts business connected with ships, as insurances, sales, etc. (see below). SHIP-BUILDER, one who constructs ships. SHIP-BUILDING, art of constructing ships (see below). SHIP-CANAL, canal connecting two seas, two navigable rivers, or two large pieces of water, and through which vessels of large burden can pass (see INTEROCEANIC SHIP CANAL). SHIP-CARPENTER, a carpenter who works at the building of ships. SHIP-CHANDLER, one who supplies ships with cordage, canvas, etc. SHIP-HOLDER, or SHIP-OWNER, a proprietor of a ship or ships. SHIP'S HUSBAND, one who looks after and provides stores, provisions, etc., for a ship (see below). SHIP-LOAD, the load or cargo of a ship. SHIP-MASTER, the cap-

tain or commander of a ship. SHIPMATE, a fellow-sailor SHIP OWNER: see SHIP HOLDER. SHIP-SHAPE, in a seaman-like manner; neat; trim; well put; properly. SHIP-WORM (see TEREDO). SHIPWRECK, n. loss or destruction of a ship at sea by foundering, striking on rocks or shoals, collision, or by other means (see below): destruction; miscarriage: V. to destroy, as a ship; to throw into or be in distress or difficulty, as by shipwreck. SHIPWRECKED, a. cast ashore on rocks or banks; destroyed. SHIP-WRIGHT, a ship-carpenter. SHIP-YARD, a place adjoining the sea where ships are built and repaired. A SHIP OF THE LINE, one of the large vessels of war of sufficient size and armament to take its place in line of battle. SHIPPING ARTICLES, articles of agreement between the captain and his seamen. SHIP'S PAPERS, certain documents with which every sea-going vessel must be furnished, such as the register, the charter-party, bills of lading, log-book, bill of health, etc. To SHIP A SEA, to have a large quantity of sea-water thrown on board, as in a storm. To SHIP OFF, to send away by water in a ship.

SHIP-BROKER: person employed in buying and selling and freighting of ships. His duties include adjusting the terms of charter-parties and bills of lading, settling with the master for his salary, collecting freights on goods brought into port, arranging with passengers for the terms of their passage, and generally managing all business transactions between ship-owners and the shippers or consignees of goods. A. S.-B., like other brokers, receives a commission from the seller only.

The business of an *insurance-broker* is usually combined with that of a ship-broker. In the United States, marine insurance is effected after the same manner as the insurance of other property—i.e., by the payment of a premium to an insurance company (or companies) or their agents. A very different system prevails in Britain. There the underwriters are in most cases not companies, but individual capitalists, known to the broker as persons prepared to undergo any risks which he recommends to them. The broker, who has a list of persons ready at a moment's notice to underwrite a policy, is the mutual agent for both parties. He procures the subscriptions of the underwriters, arranging with them the rate of premium and conditions of the risk; receiving from them the amount of their respective subscriptions, in the event of loss; and, when such loss is partial, arranging the proportion to be recovered from the different underwriters. An insurance-broker charges as commission five per cent. on the premium, and one-half per cent. deducted from all claims recovered from the underwriters. He is personally liable to the underwriters for the amount of the premium, but incurs no liability to make good the amount insured to the owner of the ship and goods, who, in case of loss, must look to the underwriter alone for indemnification.

SHIPBUILDING: the art of constructing vessels, especially of large size, for commerce or war. See SHIP; SHIPPING; NAVIES; NAVIGATION; ARMOR; ORDNANCE; BATTLESHIP; etc.

History.—Among the nations of antiquity the Phœnecians were the most enterprising in maritime matters, mention being made by Herodotus of their circumnavigation of Africa in 600 B.C. It is from the relics of ancient Egypt, however, that we draw the first definite knowledge with regard to the craft of this period. The earliest Egyptian drawings and records show that the Egyptians possessed or were acquainted with boats built of sawn planks, propelled by numerous oars and also by sails. Such vessels were called galleys and had usually one mast and a large square sail of linen or papyrus. From the Phœnecians the Greeks learned the art of navigation and galley construction during the various wars waged between the two nations. In the same manner the Romans in their wars with Carthage were led to turn their attention to maritime matters and to the art of navigation and shipbuilding as then existing. So far as can be learned from ancient sculptures, the galleys of the Mediterranean at the dawn of civilization were open, at least in the middle portion, were built with keel, ribs, and planking, and were strengthened crosswise by the numerous benches on which the rowers sat. The seats for the rowers were arranged in from one to five banks or tiers, the favorite type being the trireme or three-banked galley of a length of about 105 ft. by 11 ft. beam and carrying some 300 rowers and 100 or more soldiers. At the time of the first Punic war the Roman fleet is said to have consisted of 330 such vessels.

Coming down to early middle ages Venice is found as the dominant maritime power and then as her influence began to wane the center of shipbuilding changed from the Mediterranean to the Atlantic and to the North and Baltic Seas. From the earliest dawn of Scandinavian history, in fact, the Viking and his ship take a prominent part, and existing relics of this type of construction show great skill in the use of such materials as were available for ship construction and an intimate acquaintance with the characteristics best suited to the conditions imposed by the stormy waters on which they sailed. During the 14th and 15th centuries we find Spain and Portugal taking leading rank in maritime matters, a position which the voyages of Columbus for a time tended to strengthen. Spurred both by the demands of commerce and by the necessities of maritime warfare, however, England was rapidly forging to the front and a few centuries later reached a leading position in the world's commerce and in the art of shipbuilding, a position which is still held in spite of sharp rivalry by other maritime nations of modern times. During the 19th century the sailing ship as a type reached its culmination in the famous American clipper ships trading with the Orient.

Throughout this century the change from sails to steam as a motive power was gradually progressing until at the opening of the present century we find the use of sails relegated to pleasure craft, to small coasting craft and to other special cases which may be held to justify such use rather than steam. During the same period likewise the change from wood through iron to steel was gradually progressing until in 1875 or 1880 the latter had become definitely accepted as the standard material for all maritime construction except in various small and special types in which wood is still employed.

The general subject of shipbuilding may be considered under the following heads:

(1) Definition of terms and determination of form.
(2) Theoretical Naval Architecture.
    Static.
    Dynamic.
(3) Design:
    Form and characteristics.
    Structure.
    Laying down.
(4) Practical Ship Construction.

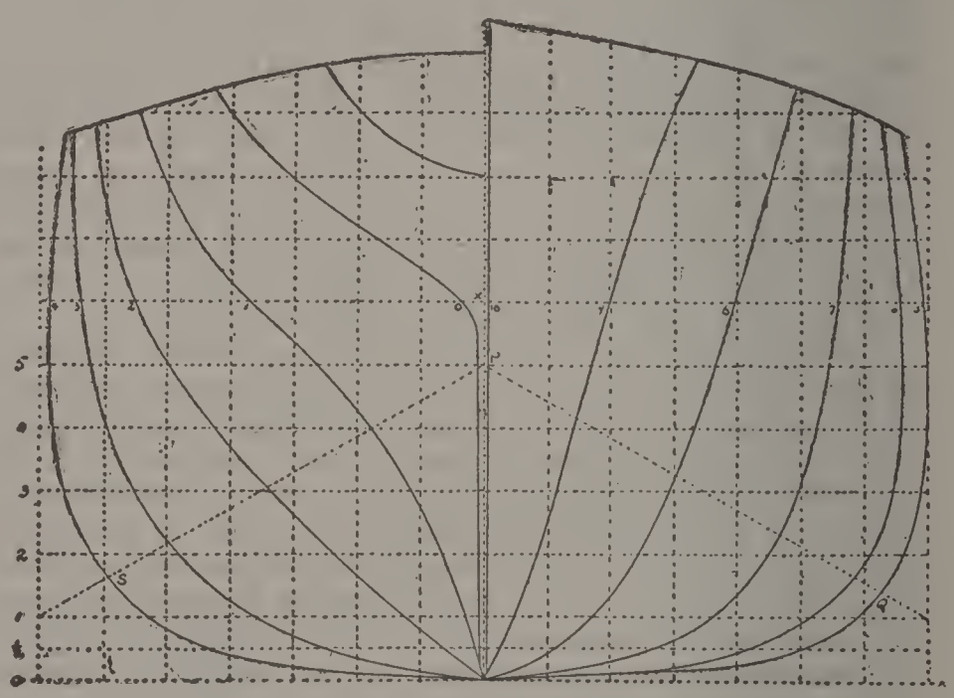


Fig. 1.

The form of the ship on which all computations are primarily based and which is the subject of determination by whatever method the naval architect may follow, is usually the so-called *molded* form; defined as the form determined by the inner surface of the skin plating or by the outer surfaces of the frames. The dimensions of this molded body are termed molded dimensions and whatever computations are based on such dimensions are subject to suitable corrections to provide for the skin plating lying outside of this surface of reference. Considering the ship as a floating body the three principal

dimensions of the immersed part are *length, breadth* and *draft* or immersion, and which will be designated by *L, B, H. Trim* is the difference between the drafts forward and aft.

The *midship section* is the maximum transverse section of the ship. It is not necessarily located at a point midway of the length, though very commonly such is the case. The *forebody* and *afterbody* are the parts respectively forward and aft of the midship section.

For the purpose of representing and discussing the form of a ship generally, reference is made to three sets of planes at right angles to each other, or to three sets of rectangular axes. The base line is taken as longitudinal, parallel to the water surface and usually at a depth below equal to the mean molded draft. The horizontal and vertical axes are then determined at right angles with the base line.

Suppose a series of vertical transverse planes to intersect the surface of the ship. The term *section* is applied either to the contour of such an intersection or to the area which it includes. These sections may naturally be collected and shown together on a transverse plane constituting the so-called *body plan* as shown in Fig. 1, in which according to usual practice the sections of the half after body are shown at the left and those of the half forebody to the right. Suppose again a series of horizontal planes to intersect the surface of the ship. Such are termed *water planes* and the lines of intersection are termed *water lines.* Such water lines may naturally be collected and shown on a single horizontal plane known as a *half breadth* plan, as shown in Fig. 2B, in which, according to common practice, only one-half the entire intersection is shown.

Suppose again a series of vertical longitudinal planes to intersect the surface of the ship. The term *bow* and *buttock* line is applied to the resulting intersection, such lines being naturally projected on a vertical plane through the base line and known as the *sheer plan.* Such a plan is shown in Fig. 2A.

Use is often made also of fore and aft planes parallel to the base line and run as nearly as may be at right angles with the surface of the ship. Such are known as diagonal planes and the intersections are known as diagonal lines. The form of a single diagonal line is shown in Fig. 2C.

The body, half breadth and sheer plans constitute the so-called *lines* of the ship. Geometrically any one of these plans would serve to completely determine the molded surface. For various reasons connected with the problem of design and with the structural drawings, however, these various plans become necessary and it is upon the dimensions furnished by them that the computations relative to the various geometrical quantities are made.

Only the main part of the ship's form can be represented in this general manner. There will be outside of

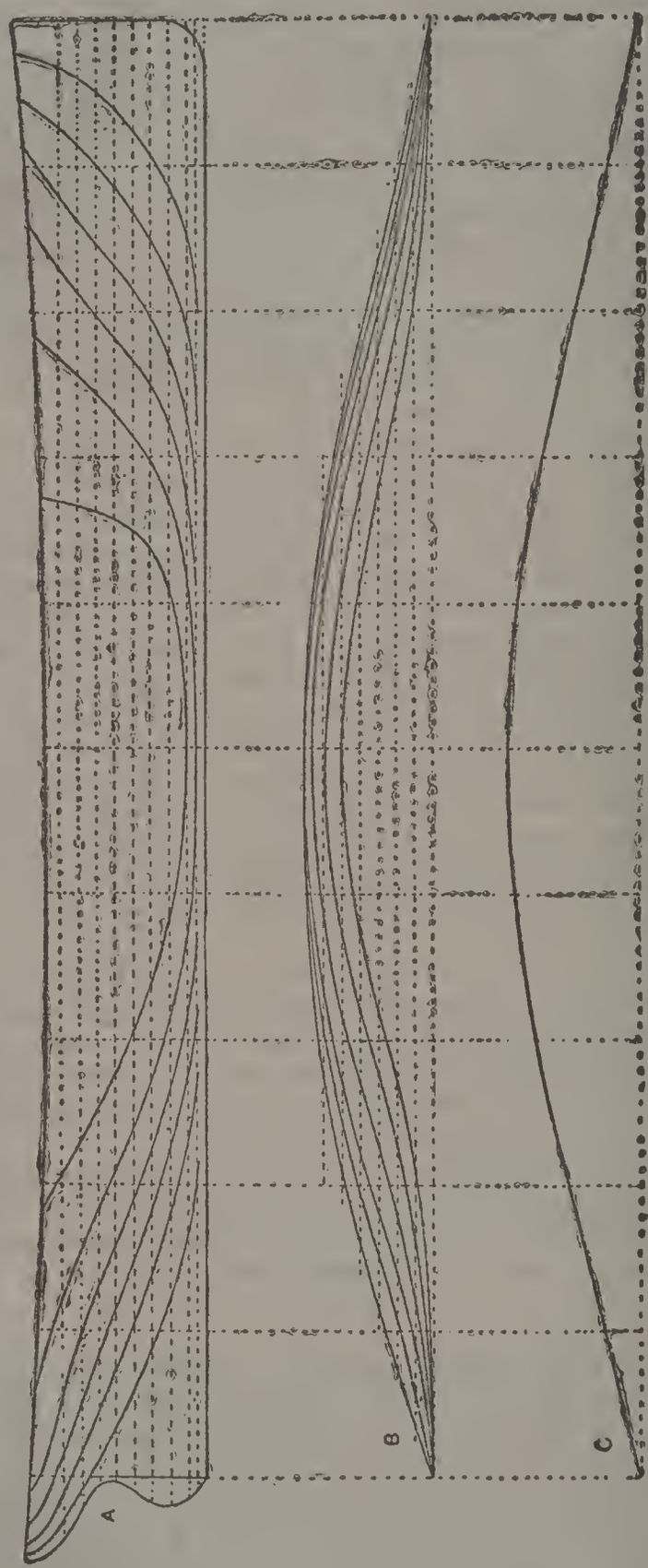
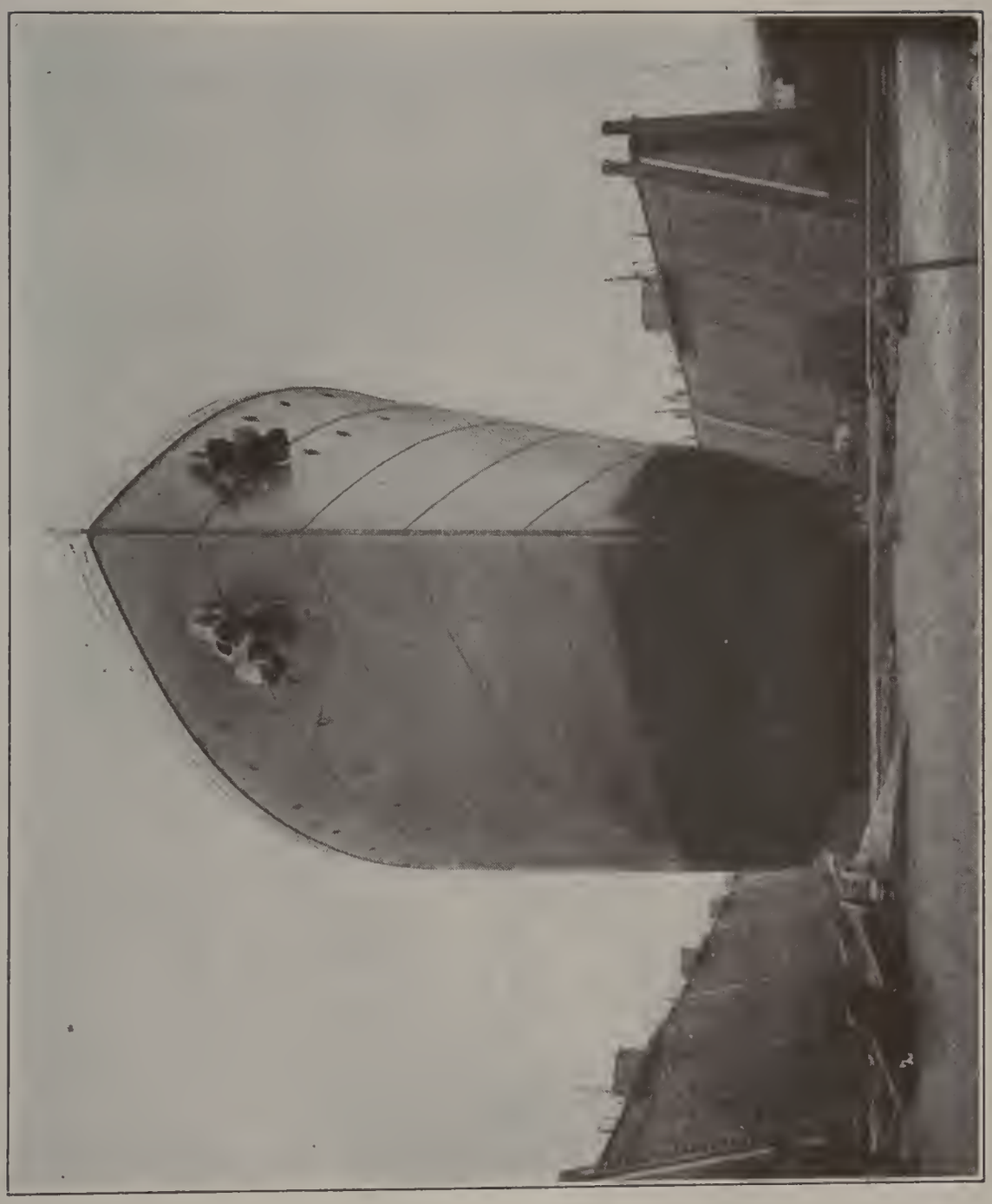


Fig. 2.



THE ATLANTIC TRANSPORT LINER "MASSACHUSETTS" IN DRY DOCK.

this main body many small parts known as corrections and appendages and which may be treated by special and individual methods.

Theoretical Naval Architecture (commonly shortened to naval architecture) is concerned with the mathematical and mechanical principles necessary in a discussion of the properties of a ship considered as a body floating partly immersed in and propelled through a body of water.

Statical Naval Architecture is concerned solely with the properties of the ship considered as a floating body at rest relative to the liquid.

Dynamic Naval Architecture is concerned with the special forces introduced by the fact of relative motion between the ship and water.

Statical Naval Architecture.—The fundamental principles of hydrostatics (q.v.) are assumed. In its broadest aspect the general problem here presented to the naval architect is the determination of the conditions of equilibrium for a ship under the influence of three systems of forces as follows: (a) The gravity system consisting of the action of gravity on the entire structure of the ship and all that it contains. The resultant of this system is of course the *total weight* of ship and contents, and the center or point of application is the so-called *center of gravity.* (b) The buoyancy system consisting of a distributed system of forces acting on the immersed surface of the ship and having a total upward resultant equal to system (1) or the weight of the ship. The center or point of application of such system is called the center of buoyancy. (c) Any disturbing set of forces tending to turn the ship about a horizontal axis and represented in a typical case by a pair of equal and opposite horizontal forces constituting a turning couple and tending to turn the ship about a horizontal longitudinal axis.

It results from the principles of hydrostatics that the entire investigation of system (b) can be made to depend on the geometrical form and dimensions of the immersed body of the ship. On the other hand the resultant of system (a) is the proposed or desired weight of the ship and lading and its point of application is either assumed by judgment based on previous experience with smaller forms and modes of construction, or otherwise may be found by a long and tedious process of computation according to the principles of elementary mechanics for finding the center of gravity of a complex body. In any event once found it remains fixed for the given condition of the ship as regards structure and lading. The resultants of systems (a) and (b) are thus determined as two equal and opposite vertical forces and hence constitute a couple having for its arm whatever horizontal distance may lie between their vertical lines of action. The ship being in equilibrium under systems (a), (b) and (c) it follows that (a) and (b) as a couple must

make equilibrium with (c), which must therefore be constituted as an equal and opposite couple. It follows therefore that the real investigation of equilibrium under varying conditions involves chiefly an examination of system (b). The principles involved show that the entire investigation will be reduced to the determination of immersed volumes both as to amount and center of figure. The entire theory of statical naval architecture therefore, so far as it depends on hydrostatic force, is made to depend on the measurement of volumes. It is thus geometrical in character, and actually is chiefly a matter of integration for volumes and for moments of volumes. Inasmuch, however, as the surfaces of ships are not mathematical in the sense of permitting of representation by algebraic equations, it follows that ordinary methods of integration cannot be followed. For such cases there are available, however, a great variety of approximate rules and methods adopted in the treatment of such problems, and permitting of being carried to any desired degree of accuracy. Much aid is also derived from various instruments capable of effecting integrations mechanically, and of which the best known and most generally useful is the planimeter.

If the above noted system of forces (c) disappears, leaving the ship in equilibrium under gravity and buoyancy acting alone, the arm of the couple constituted by (a) and (b) must become zero, leaving simply the two forces due to gravity and buoyancy, equal and opposite and acting on the same vertical line. The ship in this condition is at equilibrium or at rest in still, smooth water. The computations for such condition are required to determine various geometrical quantities and functions of the immersed volume, the more important of which for any one given immersion are as follows:

(1) The total volume and weight of the displaced water. The latter is defined as the *displacement* and equals the weight of the ship and lading, which will bring the immersion to the given point.

(2) The center of figure of this immersed or displaced volume. This is defined as the *center of buoyancy.*

(3) The area of the water plane or the area inclosed by the water line.

(4) The tons per inch change of immersion, being the weight in tons required to effect a change of one inch in the immersion of the ship.

(5) The area of the various sections from keel up to water plane.

(6) The positions of the metacenters (for definition see later) transverse and longitudinal.

(7) The ratio of the immersed volume to the volume of the rectangular prism which would just contain it and of volume $L \times B \times H$. This ratio is defined as the *block coefficient.*

(8) The ratio of the immersed volume to the volume resulting from multiplying the area of midship section

by the length of the ship. This ratio is defined as the *prismatic* or *cylindrical coefficient.*

(9) The ratio of the immersed volume to the volume resulting from multiplying the area of the upper water plane by the draft. This ratio is defined as the *mean depth coefficient.*

(10) The ratio of the area of midship section to the circumscribing rectangle of area *BH*. This ratio is defined as the *midship section coefficient.*

(11) The ratio of the area of the upper water plane to its circumscribing rectangle. This ratio is defined as the *water plane* or *water line coefficient.*

The collection of these various quantities, functions and ratios for the series of drafts or immersions constitutes a comprehensive storehouse of information for the answer of all manner of questions affecting the ship under the stated conditions of equilibrium. Such quantities are usually computed for a series of values of the draft from that for launching condition to deepest load immersion. These quantities are then represented graphically in various ways, much ingenuity having been expended in devising means for graphically showing the relation of these various quantities to changing draft.

A further important investigation has relation to the conditions of equilibrium at any specified immersion. With reference to the question of equilibrium the ship may most conveniently be compared to a suspended body in which if the point of suspension is above the center of gravity the equilibrium is stable; if below it, unstable; and if at the center of gravity, neutral. The point in the ship corresponding to the point of support for a suspended body is called the *metacenter.* It is in effect the point of virtual support and is defined as the point in which the vertical through the center of buoyancy in the upright position is cut by the vertical through the center of buoyancy for a slightly inclined position.

If the ship at constant displacement be imagined as passing through a series of positions from the upright to any given angle of inclination, then the summation of the centers of buoyancy will constitute a curve known as the curve of centers of buoyancy. In mathematical terms, the supporting force for any angle of inclination must act through the given center of buoyancy and along the normal. The intersection of normals indefinitely near together gives the center of curvature of the curve at that particular point. The metacenter is then simply the center of curvature of the curve of centers of buoyancy at the point corresponding to the upright position.

This point, the metacenter, becomes then the effective or virtual point of support of the ship in the upright position, and hence applying the usual criterion it follows that if the center of gravity is below the metacenter the equilibrium will be stable, if above it will be unstable, and if at the metacenter the equilibrium will be neutral, at least for very small disturbances from the

upright position. The requirement for stable equilibrium is therefore that the metacenter shall lie above the center of gravity. The distance above is known as the *metacentric height* and is a quantity of great importance in the general problem of ship design. The metacenter thus defined with reference to inclination about a longitudinal axis is known restrictively as the transverse metacenter. Similarly there will be a longitudinal metacenter and a longitudinal metacentric height corresponding to inclination about a transverse axis or for change of trim.

Passing over matters of relatively minor importance the principal remaining investigation in statical naval architecture is that relating to stability. Stability is commonly defined as the capacity for resisting a tendency to heel or turn the ship about a fore and aft axis and is measured by the turning moment which must be exerted to heel the ship about such an axis. This external applied turning moment or system is in effect the system (c) noted above, and from the condition of equilibrium it is clear that the stability at any specified angle of heel may be considered as measured by the moment of the external system (c) which must be applied to produce such an angle of heel; or by its equal and opposite, the moment developed by the gravity-buoyancy or (a)—(b) system when the ship is heeled through such angle.

Referring to Fig. 3, let WP be the water plane for the upright and W_1P_1 that for the inclined positions, and CC_1 the corresponding positions of the center of buoyancy. Also let G be the location of the center of

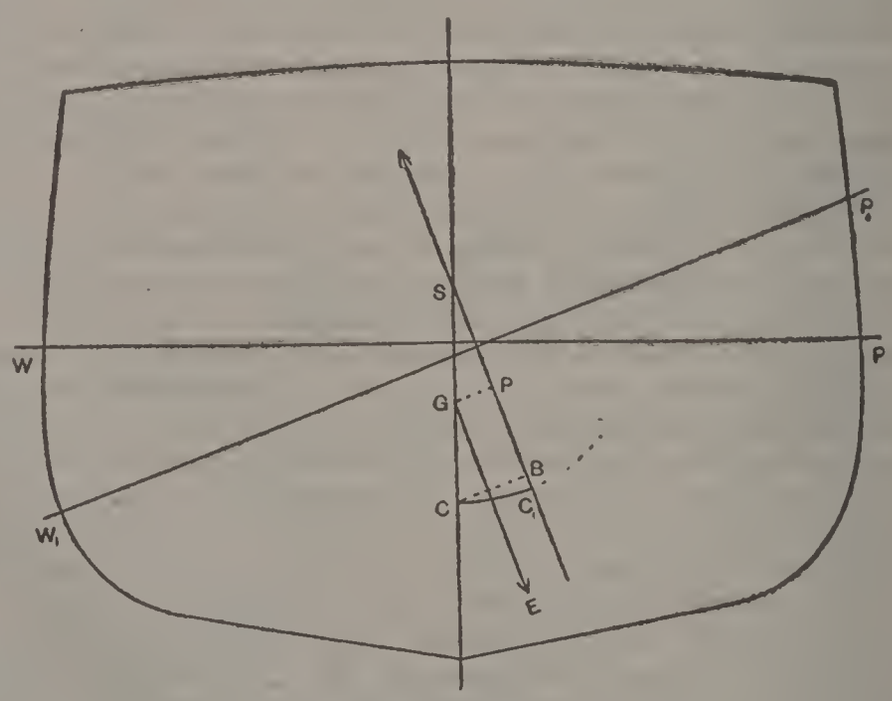


Fig. 3.

gravity. Then in the inclined position gravity will act down along GE and buoyancy upward along C_1S, each with a force measured by W, the weight of the ship.

Obviously these forces constitute a couple of which GP is the arm and of which the tendency is to return the ship to the upright position or with WP as the water plane. If, therefore, we let M denote the stability moment, W the weight or displacement of the ship and θ the angle of heel we shall have:

$$M = W \times GP = W \times GS \sin \theta = W\ (CS - CG) \sin \theta$$

or $M = W \times CS \sin \theta - W \times CG \sin \theta$.

The term $W \times CS \sin \theta$ in this equation is called the surface stability or stability of form, and is obviously the value which the stability would have if G coincided with C.

In the usual stability problem WP is given as the water plane for the given displacement and the stability for the same displacement at some inclination θ is required. It is clear that this calls simply for the location of the line of action C_1S and this is most readily located by finding the length of the arm of perpendicular CB. When the stability is desired for a double series of drafts and inclinations the problem becomes more extensive, but nevertheless for any one condition it involves no more than the location of the line of action of buoyant forces in the inclined position, as C_1S in Fig. 3, and the determination of the center of buoyancy C for the same displacement in the upright position. There exists a great variety of so-called 'stability methods' arranged for the orderly and convenient carrying out of the computations required in this determination. These various methods differ in matters of arrangement, routine, the extent to which instrumental aid is employed, the extent to which graphical methods are employed either for determination or for the representation of the results and in other points of small detail; but they all reduce ultimately to the few simple mechanical principles necessary to locate a line of action such as C_1S and a center of buoyancy such as C.

In a restrictive sense the term statical stability is commonly applied to the quantity here referred to as stability. This is in order to distinguish it from another quantity of an entirely different nature and known as dynamic stability. The latter for any given angle of heel is defined as the mechanical work required to heel the ship over from the upright to the given inclined position. Statical stability is thus measured by a moment, while dynamic stability is measured by mechanical work.

Based on the principles developed in the study of these cases of equilibrium either in the inclined or upright position a large number of special problems present themselves for consideration, of which we may here only mention by name the more important. Such are:

The effect on the position of equilibrium and on the stability of the ship due to shifting a weight from one position to another.

The effect likewise of suspending a weight from a given point rather than holding it rigid in its place.

The effect likewise of adding or of subtracting a weight to or from a given point.

The effect of opening up certain compartments to the sea.

The effect of liquid cargo.

The stability of a ship when run aground and partially supported on rock or sand, or when removed from the water by docking.

The general conditions affecting the ship during the operation of launching.

In *Dynamic Naval Architecture* the chief problems, as noted, are concerned with the forces which arise from the fact of relative motion between the ship and the water. The more important of these are as follows: The resistance developed in opposition to the forward motion of the ship through the water, commonly referred to as ship resistance or resistance of the ship; the propulsive force required to urge the ship forward against this resistance, and the development of such propulsive force by means of screw propeller, paddle wheel or wind pressure; the oscillation of the ship in still water and among waves and the influence of wind and waves on the stability of the ship; the general problem of steering and the interaction between the propeller and the rudder, especially when turning or backing.

Of this general field we can here notice only briefly the more important aspects of the problems of resistance and propulsion.

Ship Resistance.—The forces opposed to relative motion of the ship and water like the buoyant forces constitute a distributed surface system, but with a horizontal resultant opposed to the direction of relative motion. The most natural method of examination would be, therefore, the investigation in detail of the elements of such a system and the determination of the final resultant. Unfortunately the investigation of such forces in detail is a matter of great difficulty, and with our present understanding of such problems is only possible in a crude and approximate manner. It is in fact a general truth that whereas the forces dealt with in static naval architecture may be reduced to a matter of geometry and hence determined with any degree of accuracy desired, the forces which are developed by the existence of relative motion between ship and water do not admit of expression or investigation in any such simple manner and until our understanding of hydrodynamic principles is more extended than at present such forces can only be determined in a crude and imperfect manner, and by means involving to some extent the use of experimental measurement and empirical formulæ. While these forces, as noted, constitute a distributed surface system, they also give rise to certain phenomena in the water which permit of classification and which thus serve to give the basis for a like subdivision or analysis of the resistance. While this subdivision is to some extent ar-

bitrary we will here view it under four heads as follows:

(1) *Stream Line Resistance.*—The particles of liquid if some distance outward from the ship will be moved aside and then allowed to return as the ship passes, the path of relative motion for the particles and the ship being a smooth flowing curve and representing the path of such particles if we imagine the ship at rest and the water moving past it as a stream, in which case the relative motions are the same as when the water is at rest and the ship moves through it. Some energy is absorbed by viscous liquid forces in the movement of particles to and fro in this manner and the absorption and dissipation of this energy gives rise to an element of the total resistance.

(2) *Eddy Resistance.*—In cases where the stern of the ship is full and to some extent wherever the surface of the ship presents any sudden change of form or departure from such forms as serve to admit of the smooth stream line motion referred to in (1), there will be, especially in the wake of such part of the surface, a body of water thrown into more or less irregular vortex and eddy motion. Such motion is typified by the water in the wake of an oar or other like flat surface moved broadside through the water. The development of such motion requires energy which is dissipated and lost and the maintenance of any such an eddy system will therefore give rise to a further element of resistance.

(3) *Surface, Skin or Frictional Resistance.*—There exist molecular forces between the water and the surface of the ship as well as minor irregularities of form, all of which serve to develop a skin or blanket of eddying water surrounding the ship as it moves through the water. The maintenance of such a blanket of eddying water constitutes a drain of energy from the ship and gives rise to a further element of the resistance.

(4) *Wave Resistance.*—As a result of the movement of the ship through the water we have the development of certain systems of waves and surface disturbances. The maintenance of such wave systems likewise requires energy which must be supplied by the ship, and hence they will give rise to a further element of resistance.

The sum of (1) and (2) is sometimes termed the *head* resistance. The sum of (1) and (4) or (1), (2) and (4) is often known as the *residual* resistance, in which view but two kinds of resistance are considered, as follows: (a) Skin or surface resistance and (b) Residual resistance, comprising (4) and all other elements not comprised under (a). For practical purposes such is the view usually adopted and actual problems of ship resistance are therefore concerned with determination under these two heads, either separately or conjointly. The determination of the skin resistance is by formula based on the results of experiment on long thin planes drawn through the water under varying conditions and at varying speeds. According to such experiments the skin re-

sistance depends on the area, on the quality of surface as regards roughness, to some extent on the length, and on the speed through the water.

Residual resistance is determined either as the result of experiment on a reduced model of the proposed form, or by empirical formulæ based on results derived from such model experiments. The use of such models was first worked out practically by Wm. Froude in England and Tidman in Holland, such use depending on the so-called 'law of comparison' or of 'kinematic similitude.' This law briefly stated is as follows:

(1) For 'similar' ships 'corresponding' speeds are defined to be those in the direct ratio of the square roots of like linear dimensions.

(2) At corresponding speeds the resistances of similar ships are in the direct ratio of the increased volumes, or as the cubes of like similar dimensions.

In this statement the term 'similar' implies complete geometrical similarity of the immersed portions of the two forms, or of ship and model. Paragraph (1) then defines corresponding speeds for such forms and (2) states the relation between the resistances of such forms at such corresponding speeds.

If then the residual resistance of a ship at a given speed is desired it is only necessary to run the model at the corresponding speed, measure the resistance at such speed and multiply such resistance by the ratio of the two immersed volumes, and the result will give the resistance of the ship at the proposed speed.

Many refinements of observation and reduction naturally enter into this process, discussion of which must be omitted in the present account. So well has the value of such experimental observation been demonstrated that all the leading maritime nations have established extensive equipments for such research, and like establishments have also been made by certain leading shipbuilders and at certain institutions of learning.

The total resistance of the ship at the proposed speed is thus found as the sum of the two parts, frictional and residual, determined as described. The work done in driving the ship at such speed immediately follows as the product of resistance and distance, and thus the net power required for the propulsion of the ship is known. This net power is known as the *effective horsepower.*

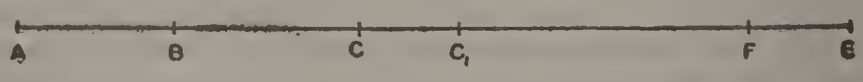


Fig. 4.

This determination of ship resistance and of effective horsepower is, however, only the first step in the determination of the actual horsepower required at the engine. To this further end the power developed by the engine and applied by the propeller may be conveniently analyzed according to the scheme shown in Fig. 4.

Let the total power developed by the engines be denoted by AE. Then a certain part AB will be absorbed by the friction of the engine and shafting, leaving the remainder BE to be delivered to the propeller. Of this a part BC is absorbed in eddies, rotation and sternward acceleration communicated to the water acted on. The remainder CE then represents the so-called *thrust horsepower* measured by the actual thrust on the ship multiplied by the speed. The thrust horsepower thus defined is not the same as the effective horsepower defined above but differs from it as a consequence of the reaction between the ship and the propeller. The action of the propeller at the stern of a ship produces a disturbance in the stream line motion and a pumping of the water away from the vicinity of the stern, as a result of which the full closing in pressure is not exerted by the water on these parts of the ship, the consequence of which is an increase or augmentation in the resistance of the ship. It is this *augmented resistance* which must be overcome by the thrust of the propeller on the ship and the thrust power CE is therefore greater than the effective horsepower CF by the amount FE corresponding to the augmentation of resistance.

This does not end the consequences of interaction between ship and propeller. The passage of the ship through the water gives rise to a condition at the stern represented by a more or less turbulent body of water following after the ship with a velocity some small fraction of that of the ship. This body of water with forward motion relative to the surrounding body of still water outside the influence of the ship is termed the *wake* and it is in this wake that the screw propeller must work. This forward velocity of the wake has the effect of giving the required thrust at a lower number of revolutions than if the propeller were working in undisturbed water and hence of realizing the propulsion of the ship with less power than would be required if such wake were not present. This reaction in effect constitutes a partial return, through the propeller, of energy put into the water by forcing the ship through it. The energy thus retained constitutes the so-called *wake return* and reduces the power required from the engine by a corresponding amount. In the diagram above, this relation may be illustrated by supposing BC_1 the power spent by the propeller in sternward acceleration on the assumption of no wake and BC, as noted above, the amount under this head in the actual case with wake. Then likewise C_1E becomes the thrust power in the case without wake and CE that with wake. C_1E also represents the network of the propeller the case without wake, while CF, as noted above, represents the effective horsepower or the amount required to overcome the true resistance of the ship.

Returning then to the question of the indicated horsepower for a given case it results that the computation or

determination of ship resistance by whatever method serves simply to give, after multiplication by the speed, the effective horsepower as represented by CF. Then, by the application of various factors drawn from experience, successive steps may be taken leading first from CF to CE, then to C_1E, then to BE, and then to AE, the power desired. Instead of passing by successive steps through these intermediate values a single factor based on experience may be used leading direct from CF to AE. Such a factor represented by $CF \div AE$ is termed the *propulsive coefficient*. In addition to this ratio the following also have received special names:

$BE \div AE$ = mechanical efficiency of engine and shafting.
$CE \div BE$ = apparent efficiency of propeller.
$C_1E \div BE$ = true efficiency of propeller.
$CE \div CF$ = coefficient of augmentation.
$CE \div C_1E$ = wake return factor.
$CF \div C_1E$ = hull efficiency.

Values of these ratios representative of good modern practice may be noted as follows:

$CF \div AE$ ..... .55 to .60.
$BE \div AE$ ..... .85 to .90.
$CE \div BE$ ..... .70 to .80.
$C_1E \div BE$ ..... .65 to .72.
$CE \div CF$ .....1.08 to 1.15.
$CE \div C_1E$.....1.08 to 1.15.
$CF \div C_1E$.....1 slightly more or less.

Instead of determining the power as the result of this analytical process, the final result is quite commonly determined directly by the use of formulæ containing certain so-called constants or coefficients, the values of which are drawn from experience.

Such formulæ, if properly employed, may in fact be considered as a means of applying a form of the law of comparison, extended by approximation to cover frictional as well as residual resistance. One of the best known of these is the so-called Admiralty formula, according to which the horsepower for a given speed is found by multiplying the two-thirds power of the displacement in tons by the cube of the speed in knots and dividing by a factor having values usually found between 200 and 300.

Propulsion.—The main problem in ship propulsion is the determination of a propulsive thrust equal and opposite to the ship resistance at the proposed speed, and hence adequate for the maintenance of the motion of the ship through the water. The development of propulsive thrust may be viewed in two ways: (a) The production of a change of momentum in matter requires the action of a force and the expenditure of energy and the matter thus acted upon will react on the agent producing such change. This reaction is in fact the resistance opposed to the change of momentum and it follows that if we provide an agent attached to the ship capable of producing

in the surrounding water a change of momentum directed sternward there will result on such agent a reaction directed forward, and available as a propulsive thrust; (b) On the other hand we may remember that a resistance is opposed to the motion of any body through a liquid and that action and reaction are equal and opposite. If then we consider the ship and the propelling agent as a pair of bodies between which relative motion is produced, there will be a force acting both ways along some line of action (not necessarily the line of motion). This force will overcome the resistance to the motion of the propeller and the reaction will urge the ship in the direction opposite, or forward through the water.

Neither of these views is able to lead us to any exact theory of the propeller. In the one case the details of the action as regards the amount of water laid hold of and the change of velocity produced cannot be known or measured in any actual case; and in the other the details of the distribution of resistance over the surface of the propelling agent cannot be accurately known. It thus results that the working theory of the propeller must be empirical in character and must depend on experimental data for the determination of such coefficients or factors as the empirical formulæ may contain.

Passing then to the screw propeller as the typical propulsive agent we may note certain needful definitions and then consider briefly the empirical theory of such action.

The screw propeller is made up of two or more (commonly either three or four) blades attached to a hub, the bounding surface on the rear or driving face being some form of helicoid, while the back or forward face takes such form as results from the distribution of the thickness needful for strength. If we could imagine the driving face working on a corresponding face fixed in position with relations similar to a bolt and nut, then the *pitch* of the propeller is defined as the axial distance traversed by the propeller for one complete revolution. The pitch thus defined divided by the diameter is termed the *pitch ratio* and is commonly found between 1 and 1.7 or 1.8.

The total area of blade surface on the driving or after side is called simply blade area or area and the ratio of such area to the area of the entire circle swept by the tips of the blades is termed the *area ratio*. It is commonly found between .35 and .50. If instead of moving supported on an unyielding surface, as above supposed, the supporting surface should yield backward slightly, then the net progress forward for the complete revolution of the propeller will be less than the pitch. This is exactly the case with the screw propeller working in water. The latter yields and recedes backward under the thrust of the propeller and the net forward movement for the revolution is less than the pitch. The amount of this backward yield is called the *slip* and the amount of

actual forward movement is then the pitch minus the slip. The slip divided by the pitch is called the *slip ratio.* In symbols if $p =$ pitch in feet, $N =$ revolutions per minute and $s =$ slip ratio, then speed in feet per minute $= pN\ (1 - s)$ and if $u =$ speed in knots we have:

$$u = \frac{pN\ (1 - s)}{101.3}$$

In the case of the propeller working at the stern of a ship we remember that it is located in the wake as defined above, and must be judged and determined primarily with reference to the water in which it works. It will be clear then that there are two speeds for the ship, one relative to the outlying body of still water and which counts as the speed commonly so-called, while the other is the speed of the stern through the wake, less than the former by the speed of the wake—usually between 5 and 15 per cent of the speed of the ship. Similarly there will be two values of the slip, one relative to the outlying body of still water and called the *apparent* slip, the other relative to the wake, the water in which the water is actually working, and called the *true* slip.

Propeller efficiency in common with all engineering efficiencies is a ratio of returns to investment or of output to input, both being expressed in terms of energy. If then T is the thrust developed, v the speed or distance per minute and W the input of work necessary to realize these conditions, we shall have:

$$\text{efficiency} = \frac{T\ v}{W}$$

From the fact that this expression for efficiency contains the speed v it follows that for the case of the actual propeller there will be one efficiency involving the speed relative to the outlying body of still water and another involving the speed relative to the wake; or one value corresponding to the apparent and one to the true slip. These values are termed respectively the *apparent* and *true* propeller efficiencies.

According to the experimental theory of the screw propeller, the work absorbed will vary with the square of the diameter, with the cube of the product of pitch by revolutions, and for the rest will depend primarily on the special conditions determined by *slip ratio, pitch ratio, area* and *form of blade.* If then values of these factors be derived by experiment on model propellers, such values may be used under similar conditions of operation and for similar proportions and forms for full-sized propellers. There exist in practice many variations in this general program, but in all rational methods of propeller design the relation of power to diameter and to the product of pitch by revolutions is equivalent to that in the statement given above.

It is beyond the scope of the present article to give

numerical values of such factors or to discuss further the general problems of propeller design. In closing this section on propulsion, however, certain general results may be stated as follows:

(1) With speed and all other conditions constant except slip the power absorbed by a given propeller increases rapidly with increase of slip—nearly as a somewhat complex quadratic function.

(2) With speed and all other conditions constant except pitch ratio the power absorbed by a given propeller decreases slowly with increase of pitch ratio.

(3) With all conditions constant the power usefully applied by a propeller of given diameter and pitch ratio increases with increase of area. For narrow blades or small areas the increase is nearly in proportion to the increase in area, such increase gradually decreasing as the areas became larger and practically vanishing at area ratio of .70 to .80. That is, practically no increase in propulsive power can be realized by an increase in the area beyond these proportions.

(4) The efficiency of a screw propeller for ordinary values of the area ratio is practically determined by the pitch ratio and slip ratio. For a given pitch ratio the value of the efficiency is low for low values of the slip rising to a maximum of 68 or 70 to 72 in the neighborhood of 20 or 25 per cent slip, and then falling off more gradually for increasing values of the slip. In general there is indication that the propeller of small area reaches its best efficiency at a relatively high slip, while large area implies a best value at about 20 per cent slip or below. The maximum values of efficiency—about 70 per cent—seem to be only in slight degree dependent on either pitch ratio or area, the best values usually being reached by fairly high pitch ratios and moderate areas. In general, propellers of high-pitch ratios reach their best efficiency at a higher value of the slip than those of low-pitch ratios.

Ship Design.—The main problem of ship design has for its object the determination of such dimensions, proportions and characteristics of form combined with such general arrangements and such details of structure as shall most economically realize the special purposes in view. For the determination of principal dimensions the problem is usually approached through the schedule of weights to be carried. To illustrate by the typical case of a mercantile cargo steamer, the two principal conditions are (1) a certain weight of cargo carried on a specified draft and (2) the same to be carried a certain distance at a certain speed. By the use of selected ratios based on experience the step may be taken from the weight of cargo to the total weight or displacement of ship. This allows next the determination of power, weight of machinery and coal. Then backward the total displacement may be further partitioned off with its principal constituents, such as weight of cargo, weight

of structure, weight of machinery, weight of coal, weight of stores and equipment. From the total displacement with the use of assumed proportions and from characteristics the principal dimensions, length, beam, draft and depth, are directly determined. In the operation thus far there will necessarily be no small amount of trial and adjustment, forward and backward, until a satisfactory combination of sizes, proportions, form characteristics and schedules of weights is reached.

The next important step involves the determination of actual form. This is called *laying down* and involves the application of the elementary principles of plane projection to the details of ship shaped forms. To note again briefly the main steps in a typical case, the elements first selected may be: (1) The load water line at the specified draft; (2) The curve of sectional areas at load draft; (3) The form of midship section; and (4) The sheer line or height of rail fore and aft. For any other section these conditions will then fix the following: (a) The area, (b) the breadth at load draft, (c) the height to rail. These items, combined with the designer's general idea as to what the form of a given section should be, will make possible its trial determination with a close degree of approximation. In this way the contours of from ten to twenty sections are determined, thus giving a first approximation to the form of the ship. The resulting water lines are then laid down, showing naturally many unfair and irregular spots. These must be corrected by modifying the form of the sections in the neighborhood, and by working back and forth between the two sets of plans until both show smooth and continuous curves. A further test may then be applied by the determination of the bow and buttock lines, or by the use of diagonal lines run in where it may be desired to have a special test of the continuity of form. The ultimate result of this series of operations will be a smooth, continuous ship shaped form, having certain main proportions and form characteristics closely as predetermined. These various plans constitute the lines of the ship and serve as the basis for the entire series of computations referred to under the head of statical naval architecture. After these various computations are completed, giving the various characteristics and values for the form as laid down, it may be necessary to go back and again modify the form in order more closely to realize certain of the fundamental requirements of the case. All engineering design, and perhaps ship design in special degree, is made up of compromise between mutually inconsistent requirements, so that the element of judgment must enter largely in the determination of the particular combination of features best suited to any given case. In closing this brief reference to the problem of design it may be of value to note the relation in which some of the more important characteristics stand with reference to the desired qualities of a ship.

A full form or high value of the block coefficient

means large carrying capacity for given dimensions, but excessive resistance at speeds above anything but the very lowest.

A shallow wide boat has great stiffness or resists strongly any disturbance tending to heel her through a small angle. Referring to the definition of stability, we may say that the stability at small angles is relatively great. It results, however, that the range is correspondingly small, so that at a moderate degree of inclination the stability or righting moment vanishes. Such a form also has excessive resistance, especially at high speeds, when the wave-making resistance comes prominently into play.

A narrow deep form on the contrary has less stiffness or a smaller righting moment at small angles of heel but a longer range, and hence such may possibly be the safer form. It has also less resistance, especially at high speeds. In Fig. 5 at *A* and *B* are shown typical curves

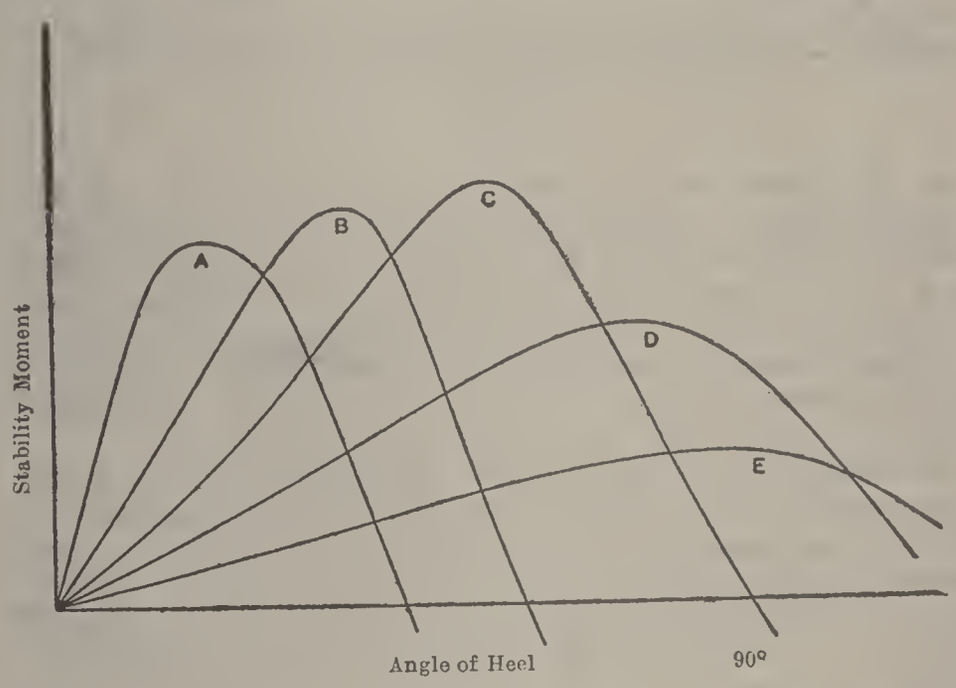


Fig. 5.

of stability or righting moment for shallow-wide forms and at *D* and *E* for narrow-deep forms, with a more common type form at *C*.

For high speeds the curve of section areas or average water line will have the general form shown at *CD*, Fig. 6, while for low speeds and permissibly fuller forms it will be more nearly as shown by *AB*.

Fullness of section is permissible or even desirable for high speeds if combined with suitable leanness of water line and of curve of section areas.

Weights carried low, such as pig iron in the hold, tend to lower the center of gravity well below the metacenter, thus increasing the metacentric height and the stability but increasing the rapidity of oscillation or rolling, while weights carried high tend to raise the center of

gravity toward the metacenter, thereby decreasing the stability and lengthening the period of oscillation.

Ship Construction.—In practical ship construction the fundamental problem is the realization in actual structural materials, of the geometrical forms and ideas which have been developed by the design through methods similar to those previously outlined. The progress of the art of shipbuilding from wood through iron to steel has been briefly noted and at the present time the latter is the only material considered for the construction of large ships. Wood is still used to some extent for sailing craft, especially schooners and other small craft, for various types of construction used in inland navigation

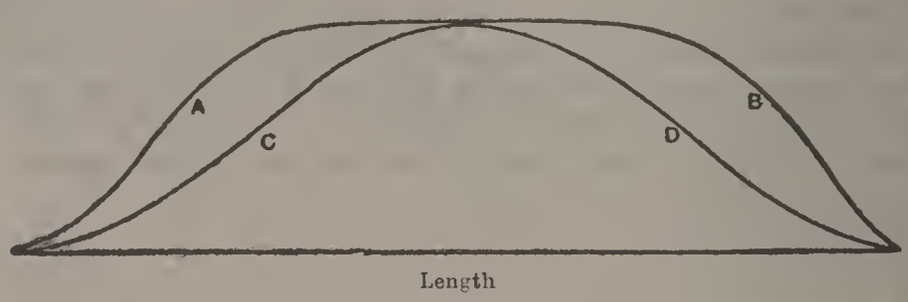


Fig. 6.

and for small yachts, launches and pleasure boats of various kinds. In any and all cases the construction may be characterized as consisting essentially of an outer skin having the form and proportions determined by the designer, and so supported and stiffened by internal structural members and with such subdivision of the internal space inclosed as to render the entire structure suited to the general and special purposes in view.

Practically the entire art of shipbuilding is based on the utilization of a few simple structural forms shaped as may be required, fastened together by riveting, and where necessary made watertight by caulking. Aside from the flat plate these elementary forms are shown in Fig. 7. In developing briefly the general character

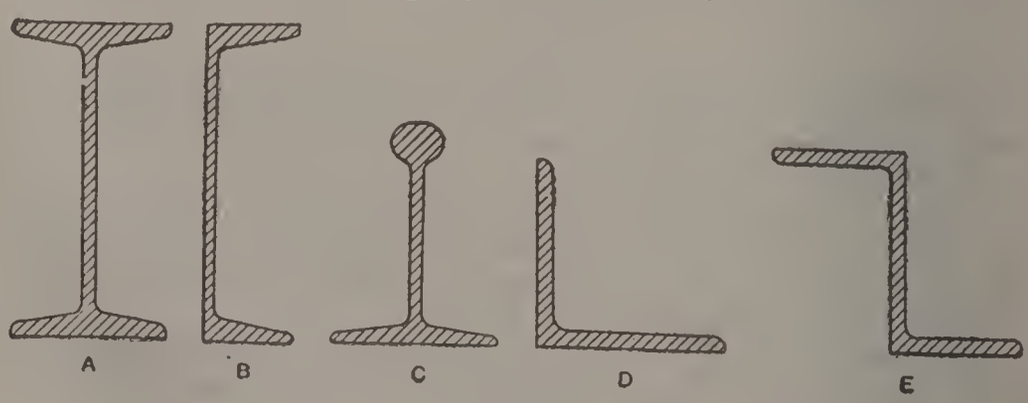


Fig. 7.

of ship construction by means of such elements it will be sufficient to note chiefly the framing or internal supporting structure. This has two primary functions: (1) To provide such general strength as shall, with the

help of the outer skin, insure the necessary strength and stiffness of the structure as a whole, and (2) to provide for the local support of the outer skin so that it will not collapse or buckle or change form locally under the water pressure or other loads to which it may be subjected. The various items constituting this internal framework may be classified as longitudinal members, transverse members, and vertical members. The general function of the longitudinal members is to contribute to the strength and stiffness of the structure as a whole, especially in the longitudinal direction, and to provide special local strength or stiffness as in the case of the keel and keelsons upon which the ship rests when building or when placed in dry dock. The general function of the transverse members is to contribute to the strength and stiffness in the transverse direction and especially against such forces as would tend to crush or collapse the sides of the ship inward. The general function of the vertical members is to tie the various decks or levels of structure together in a vertical direction, and in particular to support such decks under the loads which they may be expected to carry. Aside from the main structure of the ship, considered from the viewpoint of strength alone, there are numerous structural elements of the nature of bulkheads or partitions dividing the ship in various ways, according to the special demands of the service for which intended. They may all be made to yield some structural service, and their presence or distribution may naturally modify to some extent the general character of the ship's internal framing and structure otherwise.

The character and distribution of the longitudinal members, together with the skin plating, are shown in section in Fig. 8. In general the central longitudinal structure along the bottom of the ship is known as the keel and keelson, the former term more especially referring to the keel or bottom plates, often double, and the latter to the remainder of the construction at this point, and consisting of a vertical plate stiffened and connected by angles or other structural members to the inner and outer skins. The bottom is further stiffened and supported by similar vertical plate structures known as longitudinals, and as shown in the figure. At *Q* and *R*, Fig. 9, are shown special longitudinal structures, known as bilge or side stringers, according to location, while at *A*, Fig. 10, is shown the method of fitting a deck stringer or stringer plate, consisting of a specially heavy strake of deck plating secured to the deck beams and to the framing and outer skin, as shown.

In the earlier types of iron and steel shipbuilding the bottom was framed rather as shown in Fig. 9, consisting of Keel *A*, Keelson *B*, side Keelson *C*, stringers as noted above and transverse framing as shown and as noted below. In all modern types, however, the bottom is framed rather as in Fig. 8, comprising a definite in-

ner and outer skin, containing between them a space known as the double bottom and which is cut up by longitudinals and solid transverse framing at short intervals into small spaces or cells, from which fact the construction is commonly known as a "cellular" double bottom. The double skin and cellular arrangement thus provided serve as a protection against flooding the ship

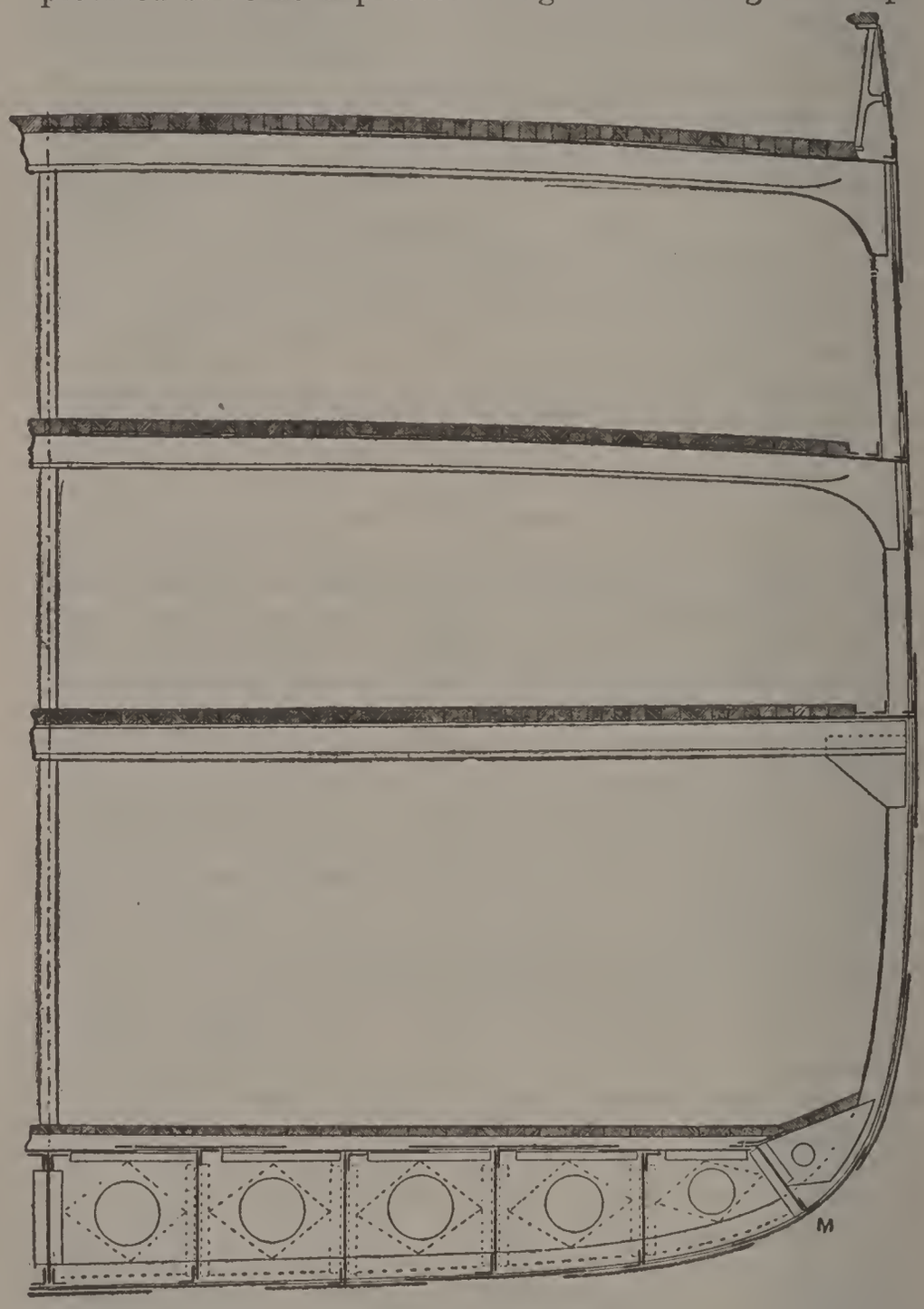


Fig. 8.

in case of the rupture of the outer skin, while the cellular space serves for water ballast, or in some cases for the carriage of oil fuel.

The principal transverse members of the ship consist of the transverse framing, of transverse partitions or bulkheads, of transverse back beams extending from side

to side and acting both as ties and struts with reference to the support of the sides of the ship and serving for the support of the various decks as well. A transverse frame consists of a structural member running usually from keel to rail and made up either of two angle irons riveted together, as shown at *G* in Fig. 9, or of a Z bar as shown at *E*, Fig. 7, or of a channel bar

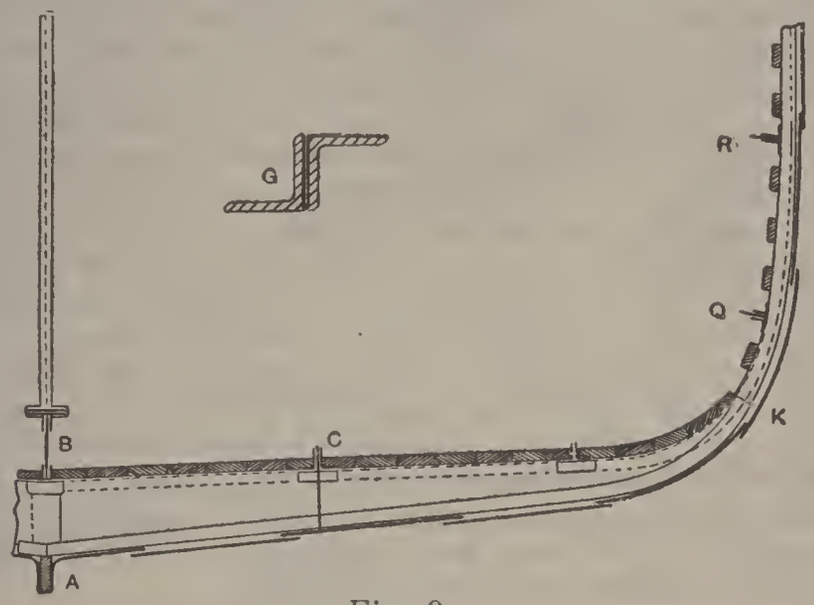


Fig. 9.

as shown at *B*, Fig. 7. This is curved to the form of the section at the point located and constitutes thus a stiffening rib or structural element lying in a transverse plane, and provides as well a flange for the attachment of the skin plating on the outside and another within for the attachment of any internal structures or connections which may be desired. At the turn of the bilge *K*,

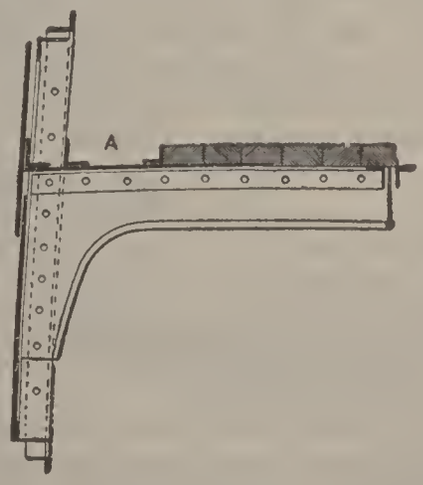


Fig. 10.

Fig. 9, the two elements of the frame may separate, one following the line of the inner skin or flooring, and the other that of the outer skin with a vertical transverse plate, known as a floor riveted between. This construction gives strength and stiffness to the bottom of the ship in both vertical and transverse directions. In the type of construction shown in Fig. 8 the double bottom

is framed up as a special structure intact in itself with top and bottom elements, and side frames are then attached at what is called the "margin plate," *M*, and thus carry the construction upward to the rail.

Bulkheads consist of continuous steel partitions extending from side to side and connected to the decks as well, thus furnishing a strong transverse tie or strut, as may be required. Decks where laid on the deck beams add also to the transverse strength. In some cases in bulk cargo holds beams alone are fitted without deck covering or plating. In most cases also additional transverse strength is gained by the fitting of an extra thick strake of horizontal plating on the decks at the outer margin, and called variously a deck stringer or stringer plate, as previously referred to and as shown in Fig. 10. In a similar manner transverse strength is often gained by the fitting of special frames, known as deep or web frames. These consist of an inner and outer member, as in the case of the ordinary frame, but with a plate of some considerable width separating the two. Such frames may, in fact, be considered as bulkheads, with the central part cut out and reinforced about the edge, and from this viewpoint their efficacy as transverse stiffeners is readily seen.

The principal members which contribute toward vertical strength are transverse and longitudinal bulkheads and deck beams, with pillars or stanchions distributed where the first named items are insufficient.

It will be seen from this brief resumé of the structural elements of a ship that primarily all possible advantage is taken of such structural aid as may be furnished by the elements which are necessitated by the general and special purposes of the ship as a structure, and that where these may be insufficient the dimensions are increased, or special and auxiliary structures or elements are introduced, as in case of pillars and stanchions, web frames, keel and keelson structures, bilge and side stringers, etc. The skill of the designer and of the builder in this connection consists in the most efficient distribution of the material thus available, and in particular of the reduction to a minimum of the material which is introduced for strength alone and which plays no other part in the general fulfillment of the purposes for which the ship is intended.

For special purposes, such as oil cargoes, grain cargoes, coal and ore cargoes, etc., various special types and modes of construction have been developed, and in all types there exists a wide field of variety in minor detail, all notice of which must be omitted in the present brief view of the subject.

Warship Construction.—In the construction of warships the same general principles are recognized and the same general character of structural elements are employed. The differences between the construction of ships for commerce and for war arise from the differ-

ences in the main conditions to be fulfilled. These are chiefly as follows:

(1) The warship, and in particular the battleship, must carry excessive local loads, as guns, armor and turrets, and must further be so strengthened as to take the excessive racking strains thrown on the structure by the firing of modern naval ordnance.

(2) Armor must be carried in such disposition and thickness as the design may demand, and turrets for sheltering the heavy guns must be fitted and supported on the main deck.

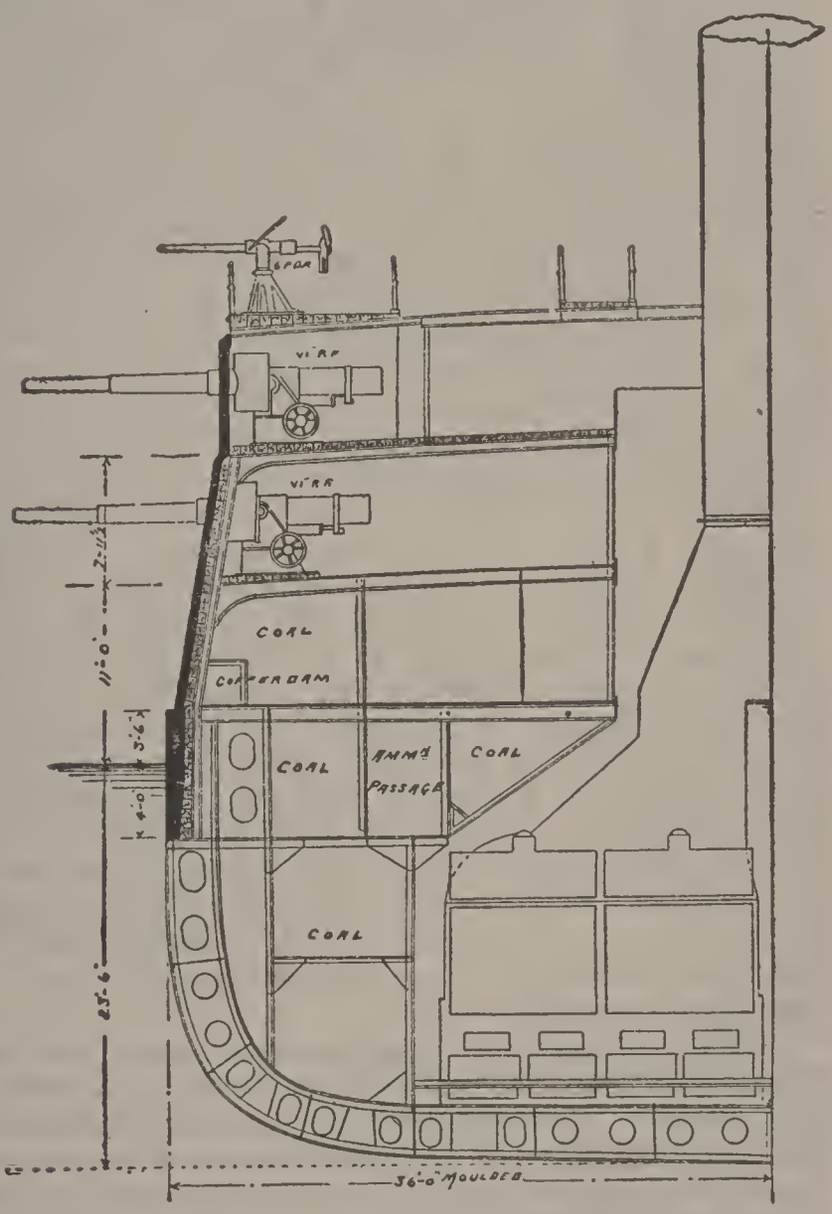


Fig. 11.

(3) The interior space must necessarily be subjected to extreme subdivision for reduction of danger from flooding in case any one compartment is opened up to the water, and also to provide the large number of store and ammunition rooms, passages, coal bunkers, etc., which the demands of the design may require. In Fig. 11 is shown a half cross section of a modern type of battleship design.

In warship construction there exists in perhaps still greater degree than in mercantile construction the widest variety of detail in minor characteristics of design and in modes of construction, and in the general solution of the many-sided problem which is presented to the designer of such structures. All discussion of such detail or variety must be omitted from this notice.

Strength of Ships.—One of the most important of the investigations in connection with the problem of structural design is that relating to the strength of the ship as a whole. The ship is considered as a structure with a distributed support coming from the forces of buoyancy and distributed along the length, according to the varying cross sectional area of the immersed body, while on the other hand it is subjected to a distributed load varying according to the distribution of total weight of structure and lading along the length of the ship. These two distributions of buoyant force upward and gravity load downward, are, of course, equal in total amount, but vary in distribution, there being in smooth water, as a rule, an excess of buoyancy amidships and of weight at the ends, with a similar relation in still more pronounced degree when the ship is supported on the crest of a wave amidships, the total length of which is about the same as the length of the ship. In all such cases there will be a net result tending to throw the axis of a ship into a curved line, convex upward. The general bending moment tending to produce such a result is known as a hogging moment. On the other hand, if the ship should be supported at the ends by a wave crest with the middle portion in the hollow, there will result, as a rule, a deflect of buoyancy amidships and an excess at the ends, with a resulting tendency to bend the axis of the ship into a curved line, concave upward. The general bending moment for such a condition is known as a sagging moment. In careful design such moments are computed for a variety of conditions of immersion and loading, and on waves of such magnitude as to include the most severe test of the strength of the ship ever likely to arise.

It then becomes necessary to investigate the strength of the structural section relative to such a bending moment, and to this end each item of the section which may take any part in the provision of strength must be listed with its net area for strength and its location. From this data the moment of inertia of the section may be determined, exactly as in the case of a plain girder, and then by the usual beam formulæ the relation between the external load and the internal stresses in the section may be determined.

The present brief account may be closed by a statement of the chief characteristics of the largest and most powerful contemporary examples of construction in the mercantile and naval fields.

The Cunard Atlantic liners *Lusitania* and *Mauretania*

have the following chief dimensions and characteristics: Length over all, 785 feet; breadth, 88 feet; depth, 60 feet 6 inches; displacement at draft of 33 feet, 38,000 tons; propulsion by four screws at speed of 185 revolutions per minute by Parsons' steam turbines of a total horsepower of about 70,000. Coal consumption per trip, about 6,000 tons. Capacity for passengers, 552 first-class, 460 second-class and 1,200 third-class. The speed realized by the *Lusitania* on trial was 25 to 26 knots. The sustained speed across the Atlantic has been about 24 knots.

The British battleship *Dreadnaught* has the following principal dimensions and characteristics: Length, 490 feet; breadth, 82 feet; draft, 25 feet; displacement, 18,000 tons. Propulsion by four screws of maximum speed of about 300 revolutions per minute by Parsons' steam turbines of about 25,000 horsepower, and giving a speed of about 21.5 knots. The main armament consists of ten 12-inch guns mounted in pairs in five turrets with a secondary battery of 3-inch guns and smaller. The most recent battleship designs in the United States show a length of 510 feet; breadth of 85 feet; draft of 25 feet and displacement of about 20,000 tons, with armament of ten 12-inch guns and secondary battery of fourteen 5-inch guns, four 3 pounders, four one pounders and two torpedo tubes. See BATTLESHIP; NAVIES; TURBINE; etc.

SHIPKA PASS, *shĭp'kâ:* pass in Bulgaria near the centre of the Balkan Mts., 3 m. n. of the village of Shipka, 14 m. s. of Gabrova; elevation 4,736 ft. It became famous from the fierce struggle here, 1877, Aug. and Sep., between the Turks under Suleiman Pasha, who made a number of unsuccessful efforts to force the pass, and a body of Russians who had seized it after crossing the Balkans by the Hainkoi Pass, and who had previously been defeated by Suleiman at Eski Sagra. The loss was great on both sides, but the Turks lost more than twice as many men as the Russians.

SHIP-MONEY: ancient tax resorted to in England at various times; revived in the reign of Charles I., without authority of parliament, for equipment of a fleet. In 1007, when the country was threatened by the Danes, a law was made obliging all proprietors of 310 hides of land to equip a vessel for protection of the coast. Elizabeth, at the time of the threatened Spanish invasion, required the various ports to fit out a certain number of ships at their own charge; and so great anxiety was shown by the public for the national defense, that London and some other ports furnished twice as many vessels as had been demanded. In 1626 Charles had recourse to an impost of this sort, requiring each of the maritime towns, with assistance of the neighboring counties, to arm a given number of vessels, 20 being required from London. In 1634 the tax was extended over the whole

kingdom. A general spirit of resistance was immediately aroused, not so much in consideration of the amount of the tax, as of the objectionable feature that it was imposed by the arbitrary authority of the king alone, which had come to be regarded as an unwarrantable stretch of the royal prerogative. In 1637, the celebrated John Hampden (q.v.), a gentleman of property in Buckinghamshire, resolved to confront the power of the govt. by disputing the legality of this exercise of the prerogative, and resolutely refused payment of the impost, an example in which he was followed by nearly the whole county to which he belonged. He was prosecuted in the exchequer chamber for non-payment, and his trial was watched with great interest and anxiety by the nation on account of the constitutional point involved in it. The judges, four excepted, pronounced in favor of the crown; but the trial had the effect of thoroughly arousing the public mind to the danger of imposition of taxes by the royal authority alone. The Long Parliament, shortly after its meeting in 1640, voted ship-money illegal; and declared the sheriffs and others who had been employed in assessing or collecting it to be delinquents; and cancelled the sentence against Hampden.

SHIPPEN, *shĭp'ĕn*, WILLIAM, M.D.: physician and surgeon: 1736, Oct. 21—1808, July 11; b. Philadelphia. He graduated at Princeton 1754, and studied medicine with his father in Philadelphia, with Drs. William and John Hunter in London, and Dr. McKenzie in Edinburgh. In 1762 he returned to Philadelphia and began practice, and began also the first course of lectures in this country on anatomy. When in 1765 the Coll. of Philadelphia, of which he was one of the founders, was opened, he was made prof. of anatomy and surgery. In 1780 he was elected to the same position in the Univ. of the State of Pennsylvania. In 1791 these two schools were united under the name Univ. of Pennsylvania, and he was again elected to the place, where he remained until 1806. In 1777 he formed a plan for the organization of a hospital dept., which with a few changes congress adopted; and Dr. Shippen was elected director-general of all the military hospitals of the United States, but owing to charges of mal-administration, never substantiated, he resigned 1781. He was for more than 40 years sec. and curator of the Amer. Philos. Soc. He died at Germantown, Pa.

SHIPPIGAN, *shĭp-ĭ-gän'*: a seaport town, Gloucester co., New Brunswick, Canada, at the southeastern entrance to Chaleur Bay, opposite Shippigan Island, 70 m. e. of Bathurst. It is a terminus of the Intercolonial Railway system, and has steam-ferry communication with Saint George's Bay, Newfoundland. It has a fine harbor, a maritime trade, and valuable fisheries. Beyond Shippigan Island Miscou Island is frequented by sportsmen for plover, the best in Canada. Pop. (1901) 3,786.

SHIP RAILWAY: see INTEROCEANIC SHIP RAILWAY.

SHIP'S HUSBAND: agent appointed by the owner of a ship to oversee its general interests. His duties may be modified by contract with the owner, but in general he must see that the ship is in proper repair, provide necessary equipment, officers and seamen, and requisite stores and provisions. He must attend to clearances, settle all contracts, make proper Charter-parties (q.v.) or freight-contracts, and preserve documents that may be necessary in case of dispute with insurers or freighters. The S. H. has no lien on the ship, cannot borrow money for its use unless specially authorized, and cannot insure the vessel.

SHIPTON, *ship'ton*, 'MOTHER': prophetess: said to have lived 1486–1561. It is certain that she gained local fame for prophecy in Yorkshire during the reign of Henry VIII. Her birthplace is unknown. Among the many contradictory statements concerning her, one is that her first name was Agatha, another Ursula, and still another that she had none. Of her last name, it is said that it was that of her husband, Toby Shipton, of her father, Solomon Shipton, and of her mother. After her death, collections of her prophecies frequently appeared, which extended her fame throughout England; but there is reason to believe that the most or a part of all of them were spurious. In 1862 a collection appeared in which was a prediction that the end of the world would come in 1881, which aroused the fears of many superstitious people, which fears were not dispelled even when the compiler of the collection, Charles Hindley, admitted that this prophecy was his own invention.

SHIP'WRECK: destruction of a vessel by shattering, sinking, or other means; also (rarely) the remains of a vessel so destroyed. Many nice distinctions have been made as to what goods constitute wreck, which is distinct from goods floating: see FLOTSAM.

A wrecked ship—i.e., one rendered absolutely unnavigable by injuries, as also the parts of a wrecked ship and her cargo cast upon the shore—was by early Eng. law declared property of the crown. By successive statutes the rights of owners were more and more largely recognized, until now the owner's right to recover 'jetsam, flotsam, lagan, and derelict' (see these titles), including all his property of whatever kind involved in a wreck, is recognized, subject only to charges for SALVAGE (q.v.). Wreckage unclaimed by any owner within a year and a day from its finding is sold on account of the public treasury. In the United States an act of congress of 1825 (*Revised Statutes*, §5358) declares the following acts to be felonies, punishable by fines and imprisonment: stealing, plundering, or destroying any money or goods from or belonging to any vessel, boat, or raft, in distress, lost, or stranded; wilfully obstructing the escape of any person endeavoring to save his life from such ship, boat, or raft; holding out or showing any false light or lights, or extinguishing any true one, with intention to bring any vessel, boat, or raft

on the sea into danger or distress or shipwreck. The legislation of the several states as to wreckage cast on the shore is generally in favor of the owner.

In the United Kingdom, the Royal National Life-boat Institution has many life-boats on the coast, and since organization has saved thousands of lives; and the Life Rocket Service (since 1854 under control of the Board of Trade) has also done excellent service.

The U. S. Life-saving Service (q.v.) has many stations. The ocean and lake coasts of the U. S. are picketed with them. The general superintendent has headquarters at Washington, and there is a corps of inspectors, superintendents, station keepers, and crews, extending over the entire coast line, together with a Board on Life-Saving Appliances, composed of experts selected from the Revenue Marine Service, the Army, the Life-Saving Service, and civilians.

At the close of 1905 the life-saving establishment embraced 277 stations, 192 being on the Atlantic coast, 68 on the lakes, 16 on the Pacific coast, and 1 at the falls of the Ohio, Louisville, Ky.

The number of sea disasters, 1871-1905, was 15,631, involving $227,642,559. Of this amount, $179,758,512 was saved by the service, the aggregate sum actually lost being $47,884,047. The number of lives in danger during the period was 111,056; the number of lives lost, 1,098. Within the same period 18,930 persons were succored at U. S. life-saving stations. Only 61 vessels were totally lost. Besides this service, there were 420 casualties to smaller craft in which were 955 persons. Of these, 945 were saved. The cost of the service, 1905, was $1,799,644.32. There were 357 shipping disasters handled by the life-saving service during 1906. Only 49 ships of this number were totally lost and only 19 lives lost out of 4,099 placed in jeopardy.

SHIRAS, *shī'răs*, GEORGE, JR., LL.D., 1832— ——; b. Pittsburg, Pa.: jurist. He was educated at the Ohio univ. and the Yale law school, and admitted to the bar at Pittsburg. He has since practiced in that city, having been concerned in nearly every important suit tried in w. Penn. since his admission to the bar. In 1892, July, he was nominated by Pres. Harrison to be an assoc. justice of the U. S. supreme court, succeeding Judge Bradley, and was inducted into office in Oct. following. He resigned in 1903.

SHIRAZ, *shē'răz'*: city of Persia, cap. of province of Fars; formerly a flourishing city, and the ordinary residence of Persian monarchs, but now divested of its ancient splendor. It is in a wide plain, on one of the limestone ledges which shoot out from the great West-Persian mountain system, 112 m. from the Persian Gulf, 35 s.w. of the ancient Persepolis (q.v.). It is inclosed by walls nearly 4 m. in circumference, and, previous to the earthquakes which repeatedly laid it in ruins, had many splendid mosques, bazaars,

caravansaries, and other public buildings. The houses, mostly of stone, are superior in appearance to those of most other Persian towns; and the adjoining portion of the plain is of exuberant fertility, and is laid out in vineyards and in rose gardens of great extent. The principal manufactures are silk, cotton, and woolen goods, cutlery, firearms, glass, and earthenware. The wine of S., which is very strong and resembles Tokay, is still famous throughout the East; its quality is in question among European judges. Rose-water is still prepared in large quantities. The trade of the town is transacted in the *Bazar-i-Wukell*, about a quarter of a mile long by 40 ft. wide, accommodating several hundred shopkeepers. S. has trade with Yezd, Ispahan, and Bushire, from the last receiving Indian and European goods. The city was founded 697, and from its beautiful situation and charming climate, became a favorite resort of the Persian princes; but a destructive earthquake 1812 laid a large portion of it in ruins; and another in 1824, which cost the lives of 4,000 inhabitants, completed the wreck of its prosperity. It was, however, rebuilt, and had attained a pop. of 40,000 (pop. previous to 1812 having been almost 60,000), when a third and more terrible earthquake 1853, Apr., laid almost the whole town in ruins, and caused the death of 12,000 people. It has since been partially rebuilt in inferior style.—It is celebrated for the number and eminence of the scholars and poets to whom it has given birth; chief of these is Sibuyah, the first of Arab grammarians; Hafiz (q.v.), the 'Anacreon' of Persia, whose tomb is half a mile n.e. of the Ispahan gate; and Saadi (q.v.), whose mausoleum is 22 m. to the n.e. See *History of Persia*, by Clements Markham, 1874.—Pop. estimated 25,000.

SHIRE, *shē'rā:* river of s.e. Africa, flowing from Lake Nyassa, and after a southerly course of 250 m. joining the Zambesi. It is 80 to 150 yards broad, 12 ft. deep, and never varies more than 2 or 3 ft. from the wet to the dry season. Its current has a rate of 2½ knots an hour. The navigation is obstructed by cataracts for 35 m., in which it falls 1,200 ft.

SHIRE, n. *shīr*, but in composition *shēr*, as in Hampshire, *hămp'shēr* [AS. *scir*, a territorial division; *sceran*, to cut off, to divide: Ger. *scheren*, to cut: Dut. *scheuren*, to tear, to cut]: district or division of a country; county; territorial division under a sheriff. SHIRE-CLERK, *shīr-*, a certain officer appointed by the sheriff. SHIRE-MOTE, n. *shīr'mōt*, anciently a county court or meeting. KNIGHT OF THE SHIRE, a county M.P. in Britain.—*Shire* is a term which seems to have originated in the 8th c., and is applied to the districts, otherwise called counties, into which Great Britain is divided. A considerable number of the counties of England, as Kent, Essex, Surrey, Norfolk, Suffolk, were formed out of the petty kingdoms of the Anglo-Saxons, which, with the advancing tide of centralization, were gradually becoming consolidated into one great kingdom. As early as 800, an entry in the Saxon Chronicle relates that kings had ceased to reign among

the *Hwiccas* (the inhabitants of the district afterward known as Worcestershire), and that they were governed by an ealdorman acting under Cynwulf, King of Mercia. This substitution of ealdormen (or earls) for kings marks the gradual organization of the counties It was sometimes found convenient to divide a kingdom into several shires. The civil, military, and judicial head of the S. was the ealdorman, whose office was not necessarily hereditary, though it had sometimes a tendency to become so. Twice a year he held the shire-mote, in which he and the bishop presided with equal jurisdiction. Among other questions which would come before the shire-motes were those that related to the boundaries of the respective shires. As a border thane pushed his occupation toward the frontiers of the S. to which he belonged, and came into collision with the occupants of the neighboring S., questions necessarily arose which could be settled only by a compromise arranged by the two shire-motes, and these compromises may account for the irregular jagged boundaries which separate S. from S., with occasional isolation of particular portions. Yorkshire, Durham, Cheshire, and Worcestershire derived their name from their ancient bishoprics. Various shires which had formerly an existence in the north, e.g. Norhamshire, Islandshire, Hexhamshire, Hallamshire, Bamboroughshire, have merged into others. The term S. is nearly synonymous with county, yet not quite so, as there are certain counties with whose names the suffix 'shire' is never used. One explanation which has been given of this usage is, that the object of the addition of the syllable 'shire' is to distinguish the county from the town of the same name, and that it is therefore applicable only to counties bearing the same name with their county town. Another explanation is, that S , being a word of Anglo-Saxon origin, is not properly applied to any of the English counties except those which formed part of the larger Anglo-Saxon kingdoms. Neither of these reasons is exactly correspondent with actual usage, by which S. terminates the names of all the English counties except the following: Northumberland, Cumberland, Westmoreland, Durham, Norfolk, Suffolk, Essex, Sussex, Middlesex, Kent, Surrey, and Cornwall. In Cheshire, the final syllable of the town of Chester is dropped. Berkshire, Shropshire, and Hampshire are never used in their simple form, though sometimes abbreviated into Berks, Salop, and Hants. S. is applied to all the Welsh counties except Anglesea.

In Scotland, the English tendencies of the sovereigns from the time of Malcolm Canmore to the war of succession, and the tide of immigration from the south, brought in, among other innovations, the division into shires. Its introduction seems to have begun early in the 12th c.: 25 shires or counties are enumerated in a public ordinance of 1305. Nearly all the counties of Scotland may receive the terminal addition of shire: see STEWARTRY. The Irish counties are not generally called shires.

In England, s. of the Tees, there was a subdivision of

the shires into *hundreds*, which originally, in theory at least, seem to have been districts inhabited by 100 or 120 families (or in which there may have been a hundred sureties to keep the peace), and were in some localities called *wapentakes*, these hundreds or wapentakes being further subdivided into *tithings*, inhabited by ten free families; and it became incumbent on every one to be enrolled in a tithing and hundred for purposes of civil government. In some larger counties there was an intermediate division to which that into hundreds was subordinate: Yorkshire had and still has its *Ridings* (q.v.), Kent its *Lathes*, and Sussex its *Rapes*. The division into hundreds and tithings never penetrated into the four n. counties of England, or into Scotland, where the *ward* and *quarter* were the immediate subdivisions of the county See HUNDRED: TITHING: TRIDING: WAPENTAKE: also COUNTY: COUNTY CORPORATE.

England possessed three *counties palatine*—Cheshire, Lancashire, and Durham—of which the earls formerly possessed all the judicial and fiscal powers of the crown—all now annexed to the crown (see PALATINE). Similar privileges belong to the earldom of Stratherne in Scotland. —For county authorities see COUNTY COURTS: SHERIFF: LOCAL GOVERNMENT: ETC.

SHIRK, v. *shĕrk* [a modification of SHARK, which see]: to avoid or escape from anything by underhand proceedings; to seek to avoid the performance of duty; to slink from. SHIRK'ING, imp. SHIRKED, pp. *shĕrkt*. SHIRKER, n. *shĕrk'er*, one who shirks duty or danger; a shirk.

SHIRLEY, *shĕr'lĭ*, WILLIAM: colonial gov. of Mass.: 1693–1771, Mar. 24; b. Preston, England. He emigrated to Boston 1734, and engaged in the practice of law. He was a commissioner for settlement of the boundary between Mass. and R. I.; gov. of Mass. 1741–45; and planned the expedition which resulted in the capture of Louisburg 1745. He spent 1745–53 in England; resumed the governorship 1753; and was commander-in-chief of the British forces at the beginning of the French war 1755. He became lieut.gen. 1759; was for a time gov. of one of the Bahama Islands; but returned to Mass. 1770, and died in Roxbury. He published *Electra*, a tragedy; *Birth of Hercules*, a mask; *Letter to the Duke of Newcastle*, with a journal of the siege of Louisburg (1745); and an autobiographical sketch (1758).

SHIRR, n. *shĕr:* the insertion of elastic lines or cords between pieces of cloth. SHIRRED, a. *shĕrd*, having elastic lines or cords inserted between pieces of cloth, as the strings of India rubber in men's braces; drawn up by parallel gathering threads.

SHIRT, n. *shĕrt* [Icel. *skyrta;* Dan. *skiorte;* Sw. *skjorta*, a shirt: Ger. *schurz*, an apron—from SHORT, which see]: a loose under-garment of linen, cotton, or other material, worn by men. SHIRT'ING, n. cloth for shirts. SHIRT'LESS, a. *-lĕs*, without a shirt. SHIRT-FRONT, the part of the shirt seen under the waistcoat.

SHIRWA, *shĕr'wa,* or TAMANDUA, *tâ-mân'dô-â:* lake of s.e. Africa, its north end 30 miles s.e. of Lake Nyassa; lat. of centre 15° 10′ south, long. 35° 40′ east. It is of oval shape, tapering to the south; length 60 miles; breadth 10 to 23 miles; 1,800 ft. above sea-level. It is surrounded by high land. On the west, between the lake and the river Shiré, Mt. Zomba rises 7,000 feet. Several small rivers enter the lake on the south and west.

SHISHAK, *shĭ'shăk* (in hieroglyphs, Sheshenk, the Susak, or Susakim of the Septuagint, and the Shishak of the Hebrew version, the Sesonchosis or Sesonchis of Manetho): name of several monarchs of the 22d, or Bubastite Egyptian dynasty, supposed to have descended from foreign settlers in Bubastis, and to have been of Semitic origin. Notable among the kings of this name was Shishak I., first monarch of the dynasty, whose name is found in the portico built by the Bubastite dynasty at the great temple of Karnak, and on several statues of the goddess Pasht, which probably were brought from Luxor. The accession of Shishak I. is variously dated by Egyptologists; probably between B.C. 972 and 1015. Jeroboam fled to Shishak from the pursuit of Solomon, who wished to kill him, and lived there during the lifetime of Solomon. On Solomon's death Jeroboam quitted Egypt, and contended with Rehoboam for the crown, causing the division of the kingdom of David into two states, Israel and Judah. In the fifth year of Rehoboam, Shishak marched to Jerusalem with an army of 12,000 chariots, 60,000 cavalry, and an innumerable number of infantry, composed of Troglodytes, Libyans, and Ethiopians. He took the city, the treasures of the temple, and all the gold bucklers which Solomon had made. The conquest of Jerusalem is found recorded on the monuments of Karnak, on which Shishak I. is represented dragging before the god Ammon three files of prisoners, inscribed with various names of places, among which are Judæa, Mageddo, Ajalon, Mahanaim, and other towns taken by Shishak in his line of march.

SHITTIM, n. *shĭt'tĭm* [Heb. *shittah*, plu. *shittim*]: species of wood of which the ark of the covenant, and the tables, altars, and boardings of the Jewish tabernacle were made; probably the wood of some species of Acacia —perhaps the *Acācĭa seyal* or *Acacia vera*, or Shittah-tree, ord. *Leguminōsæ,* sub-ord. *Mimōscæ.* Some writers, however, refer the term to a species of Olive (*Olea similis*), whose wood is beautiful and durable.

SHI'VAISM: the religion of the Shivaites, or worshippers of Shiva, an ancient Dravidian divinity of Southern India. His proper name was Mahâdêwa, 'greater god'; but the title Shiva, 'the good,' was more generally applied to him by his votaries. While Shiva is the most popular of the Hindu pantheon, his worship more widely obtains in the south than in the north, although his

throne is the Himalayas, and he is a destroying god, yet sometimes restoring and fructifying in influence. Thus in the south he is widely honored under the symbol of the phallus or lingam. Although he is a Dravidian god, in the struggle between Brahmanism and Buddhism he was adopted into the Brahmanistic system and identified with the Vedic Rudra, god of storms. Consult: Muir, *Original Sanskrit Texts;* Wurm, *Geschichte der indischen Religion* (1873).

SHIVE, n. *shīv* [Sw. *skifwa;* Icel. *skifa;* Dan. *skive,* a slice (see SHEAVE)]: slice or thin cut; little piece or fragment. SHIVES, n. plu. *shīvz,* circular disks of wood used as stoppers or bungs for casks instead of cork; corks for wide-mouthed bottles.

SHIVER, v. *shĭv'ėr* [dim. of SHIVE, a slice: Icel. *skifa;* Dan. *skive,* a thin slice: Icel. *skifa,* to cleave or split]: to break or fall into many pieces or splinters; to dash to pieces by a blow: N. a small piece or fragment of a thing broken by sudden violence; a species of blue slate. SHIV'ERING, imp. SHIV'ERED, pp. *-ėrd:* ADJ. shattered. SHIV'ERY, a. *-ėr-ĭ,* loosely coherent. SHIV'ERS, n. plu. *-ėrz,* the chips which arise from the dressings of building-blocks; in *geol.,* any loose sandy shale. SHIVER-SPAR, a carbonate of lime, so called from its slaty structure.

SHIVER, v. *shĭv'ėr* [Dut. *huiveren,* to shiver: Icel. *skialfa;* Dan. *skiælve,* to tremble]: to quake; to tremble; to shudder; to shake as from cold or fear: N. a shaking fit; a tremor; a shudder. SHIV'ERING, imp.: N. a trembling; a shaking with cold or fear. SHIV'ERED, pp. *-ėrd.* SHIV'ERINGLY, ad. *-ėr-ĭng-lĭ.* SHIV'ERS, n. plu. *-ėrz,* the ague.

SHIYAITES. See SHIITES.

SHOA, *shō'â:* kingdom of Africa, most southern division of Abyssinia; lat. 8° 30′—10° or 11° n., long. 38°—40° 30′ e. Its boundaries, however, are not fixed, its w. limit, where Shoa is bordered by the Galla tribes, being specially variable. An extensive tract in the e. of the kingdom, between the capital, Ankobar, and the river Hawash, is called Efat. For the character of the country, and condition of the people, see ABYSSINIA.

SHOAD, n. *shōd* [a corruption of SHED, to shake off, to scatter: Ger. *schutt,* rubbish; *schütten,* to shed, discharge]: broken ore mixed with rubbish, found by miners in searching for a lode, and which guides them to it. SHOADING, or SHODING, n. *shōd'ĭng,* searching for fragments of ore in the gravel of a stream or valley with the view of tracing the vein from which they have been *shed* or dispersed. SHOAD-STONE, a detached fragment of ore.

SHOAL, n. *shōl* [AS. *scolu,* a company or multitude: Dut. *school,* a shoal of fishes, a flock of birds: Ir. *sgol,* a shoal of fishes]: a great multitude; a large crowd, applied to a vast number of fishes swimming together: V. to

OCT 21 1911

One copy del. to Cat. Div.

OCT 21 1911

LIBRARY OF CONGRESS
0 033 261 288 8